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VETERINARY MEDICINE

SEPTEMBER 1945

FORESTRY

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VOL. XI. No. 9

Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of March 3, 1879.

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VETERINARY MEDICINE

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VOL. XL SEPTEMBER, 1945 No. 9

Published Monthly by the
VETERINARY MAGAZINE CORPORATION
7632 S. CRANDON AVE., CHICAGO 49, ILL., U.S.A.

$4.00 a year; per copy 50 cents; Special Issues $1.00

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Entered as second-class matter Nov. 8, 1920, at the post office at Chicago, Ill., under the Act of March 3, 1879. Entered as second-class matter under the title of American Journal of Veterinary Medicine July 19, 1910, at Chicago, Ill., under the Act of March 3, 1879.

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At the recent Denver fat stock show, two Hereford bulls were sold for $50,000 each.

Gammexine, sometimes referred to as "666," is a sort of super-DDT. Its toxicity to insects is twice as great as that of DDT but it is not yet known whether its effect is so long lasting. Gammexine is a gamma isomer of benzene hexachloride. It has long been known but its toxicity for insects was discovered only recently, by British chemists.

McCrea, *et al.*, report the cure of a case of actinomycosis in an army officer by massive injections of penicillin. The case was of 16 months standing and had been hospitalized previously but not diagnosed. The patient was given intravenous injections of 80,000 units every four hours for 15 days—a total of seven million units. At the end of the 15-day period of treatment recovery was complete.

In experiments or in treatment where a large number of intravenous injections are given thrombosis of all available superficial veins often results. Long continued injection, too often destroys the vein. Zimmerman of the Harvard Medical School avoids these difficulties by the use of a flexible plastic tubing which may be inserted through the needle and may be left in place as long as desired without injury to the vein. Tubes have remained in the jugular veins of dogs for five weeks with no untoward results. A 15-gauge needle is inserted in the vein in the usual way; the plastic tube threaded through it, and the needle removed. When not in use the tube is plugged with a sterile pin.

A major fallacy is implied in the modern attitude toward diet. It is that the appetite cannot be trusted, but laboratory investigations can. Surely we have been endowed with the sensation of taste for some purpose. Eating should mean roasts, sauces, puddings, pies—not calories, vitamins, minerals.—Harry Bakwin, M.D.

Skin grafting on a hemophilia patient by the use of a preparation of thrombin and sulfanilamide was accomplished successfully by Drs. C. S. Davidson and Stanley Levenson of Boston. The patient had been hospitalized 14 times previously for various, mostly minor, injuries. The family history of the patient listed many members who were hemophilics.

The Chicago health department will test a large number of pigeons to determine if they are carriers of a virus type pneumonia (ornithosis), which is communicable to persons. A similar test of Philadelphia pigeons a few weeks ago revealed 45% of the birds to be carriers of the virus and an order (June 20th) for extermination of the birds in public squares and parks was issued.

In a search for antibiotic agents Beaudette and associates of the New Jersey Agricultural Experiment Station tested 150 organisms—bacteria, fungi and actinomyces—isolated from straw-compost, manure, drainage material and soil. Three of these organisms gave some indication of inactivation of fowl pox virus *in vitro* and possibly also against laryngotracheitis virus. No claims can be made regarding their antiviral potentialities at present.

James I. Gibson—1865-1945

The death of Dr. James I. Gibson at the age of 80 years at his home in Cedar Rapids, Ia., July 6, 1945, removes a nestor of the profession in that state and brings to a close an unusually active professional career of 58 years.

Doctor Gibson was born near Ottawa, Ont., Jan. 27, 1865; and was graduated from the Ontario Veterinary College in 1887. He practiced at Kemptville, Ontario, two years and located in Denison, Iowa, in 1889. In 1896 he was appointed state veterinarian and served in that office six years; then practiced in Des Moines nine years. In 1911 he was reappointed state veterinarian and served till 1919 when he resigned to manage the Illinois branch of the Purity Serum Co. at Bloomington, Ill. Later he was employed by the Illinois Veterinary Medical Association for a year. Next, he was Livestock Commissioner at South Saint Joseph, Mo. for six years and two years with the Hilyard Chemical Co. of St. Joseph. Returning to Des Moines in 1930 he became a special representative of the Jensen-Salisbery Laboratories and, in 1937, manager of the Cedar Rapids branch of that organization, which position he occupied until his death.

Doctor Gibson was known to every veterinarian in Iowa and widely known throughout the Middle West. He attended a great many veterinary association meetings at which he contributed much to the entertainment and goodfellowship by singing and story-telling, in both of which he possessed unusual talent and took unflagging enjoyment. As a booster for "Ioway" he had no superior. He served as president of the United States Livestock Sanitary Association, the Missouri Valley Veterinary Association, the Iowa Veterinary Medical Association and of the Iowa State Board of Health.

In 1892 Doctor Gibson married Minnie May Colegrove, by whom he is survived. A daughter and grandson also survive him.

Amended Illinois Veterinary Practice Act

At the 1945 session of the Illinois legislature, the veterinary practice law of the state was revised. The principle changes are: (1) provides that applicants for a license to practice must be graduates of a veterinary college approved by the state Department of Registration and Education, (2) defines veterinary practice, (3) adds to the causes for which a license to practice may be revoked, (4) provides for reciprocity with other states in issuance of licenses and (5) increases the penalties for violation of the act.

The old Illinois veterinary practice law, enacted 46 years ago required the examining board to examine all applicants regardless of their educational qualifications. The amended law requires high school graduation, one year of pre-veterinary college training and graduation from a school of veterinary medicine having a four-year course of instruction and approved by the state department authorized to issue licenses.

Veterinary practice is defined as holding oneself out to be a veterinarian or treating, operating upon or prescribing for any physical ailment, injury or deformity of any domestic animal for pay. Castration, dehorning, vaccination and all other prophylaxis, tuberculin testing and all other diagnostic procedures are exempted from the provisions of the new practice law. Veterinary practice for which no charge is made, likewise, is not in contravention of the law. Poultry is not specifically included among "domestic animals and therefore only the courts can define the status of poultry practice under the new law.

The new law adds failure to submit reports as required by law (tuberculin, brucellosis, pullorum tests, contagious diseases, etc.) to the causes for which a license may be revoked.

It authorizes the reciprocal exchange of licenses with other states upon a basis of equality of educational standard and mutual recognition. The fee for a license so issued is $50.00.

Under the old law the penalties for violation were fines of $25.00 to $100.00. The amended law provides for fines of $100 to $200 or imprisonment in the county jail for from 30 days to six months or both fine and imprisonment.

Drs. C. N. Bramer, Evanston; L. A. Gray, Bushnell, and Paul J. Meginnis, Champaign, comprise the board of veterinary examiners for the Department of Registration and Education.

Refresher Course for Discharged Army Veterinarians

The faculty of the New York State Veterinary College, Cornell University, Ithaca, N. Y., announces its intention to offer a short refresher course in veterinary medicine for the benefit of veterinarians who have been in the military service. The course will be limited to ex-service men who are graduates of veterinary schools approved by the American Veterinary Medical Association. The dates for this course have not yet been set. They will be determined when a sufficient number of applications have been received to make the effort worthwhile. When decided upon, the dates will be announced in the veterinary periodicals and notices will be sent directly to eligible persons who request them in advance. Whether or not the course is repeated depends upon the demand for it.

The basic course will be four weeks in length, but those who wish to register for special work lasting two, four or six additional weeks will be able to do so.

The course will be given by regular staff members, possibly assisted by a few special lecturers. Emphasis will be placed on practical applications of new methods and new remedies that have come into use within the past few years, rather than to attempt a general review of all veterinary subjects.

All students will be expected to attend the regular daily clinics with the undergraduates. Daily late-afternoon colloquia are planned in which representatives of all the teaching departments will participate. In the latter it is expected that many problems of veterinary practice will be discussed, and students will be able to raise any questions that occur to them.

One afternoon each week will be devoted to a field trip—to slaughter houses, farms, dairy plants and other points of educational value and interest. The early part of the other afternoons will be devoted to practical work in a number of subjects such as surgical anatomy, surgery, bovine mastitis study, poultry pathology, diagnosis of brucellosis, hematology, breeding diseases, parasitology, urine and blood analysis, etc., each student selecting one of the offerings for a minimum period of one week.

Regular lectures will be given at 8 and 9 o'clock on six mornings of each week. During the first week the subjects offered will be "Diseases of Large Animals" and "Surgery of Large Animals"; during the second week, "Nutrition," "Breeding Problems," and "Diseases of Large Animals"; during the third week, "Diseases and Surgery of Small Animals," "Parasitic Diseases," and "Diseases of Poultry"; during the final week, "Infectious Diseases," "Diseases of Small Animals," "Business Law," and "State and Federal Disease Control Laws and Regulations."

A registration and tuition fee of $25 will be charged for the four-week course; for longer periods the fee will be increased proportionately. There will be no other fees but students will be expected to supply their own books, special clothing and other supplies needed for their work. No responsibility is accepted for meals and housing of students but reasonable accommodations are available in Ithaca.

It is believed that veterinarians whose military duties have been different from their normal civilian activities and who, as a result, need additional education to enable them to properly resume their post-war work are eligible under the "G. I. bill" to receive both tuition and maintenance costs for such courses as that described.

Inquiries about this course may be directed to the Director of Post War Refresher Courses, Dr. Hadley C. Stephenson, New York State Veterinary College, Cornell University, Ithaca, N. Y.

Veterinary Course at Tuskegee Inaugurated

As a culmination of plans that have been in the making for two years, the first Negro school of veterinary medicine will open its doors at Tuskegee Institute, Alabama, September 30.

Under the direction of the president of the Institute, Dr. Fred D. Patterson, himself a veterinarian, Dr. E. B. Dean has been selected as dean of the new school. Doctor Dean has headed the veterinary department at Prairie View College, Texas, for more than 20 years and is well equipped for his post.

A four-year course leading to the degree of D.V.M. is planned. Competent assistants, who hold degrees from accredited veterinary colleges, have been named to head the various departments of the school.

It is reported that more than 60 applications for admission to the school have already been received, although under present arrangements, only 20 students can be accomodated.

A modern building which, when completed, will cost a half-million dollars, will be erected. The building was made possible through gifts from the General Education Board and the State of Alabama. Work on the building will not be started until the end of the war. Present plans call for a most complete plant, modern in every detail and embodying all of the latest details known to professional veterinary education.

Addition of DDT Increases Potency of Aerosol Bomb

Addition of DDT to the Army's insecticide dispenser, known among troops in the Pacific as the aerosol bomb, has greatly increased the effectiveness of the insecticide mixture in that now it kills not only mosquitoes but also disease-bearing flies.

Composition of the new mixture is as follows: 85% freon; 2% of a 20% pyrethrum solution; 5% cyclehexanone; 5% lubricating (hydrocarbon) oil and 3% DDT.

With DDT added, the aerosol bomb becomes an excellent weapon in the fight against malaria and fly-borne diseases.

Lower-Grade Beef for POWs and Enemy Civilians

Certain meats, meat food and dairy products which are not required to meet all of the requirements of Federal and Army specifications for foods procured for the subsistence of troops are being procured by the Army for the feeding of prisoners of war and civilians in occupied countries. These items are inspected by the Army Veterinary Corps.

In order that the Veterinary Corps inspection stamp will not be erroneously interpreted as indicating that these lower grade products procured for the purpose of feeding prisoners of war and civilians have been inspected and passed as meeting the provisions of the specifications governing procurement for troops, a supplementary stamp is to be used in connection with the standard inspection stamp.

Ohio Veterinary Survey

From time to time veterinary associations have appointed committees to ascertain the needs in veterinary personnel for their states, or for the whole country, projected over the years of the immediate future. A recent veterinary survey in Ohio, by the secretary of the state veterinary medical association, brought out some information one could wish were available for all states. The following is abstracted from this survey:

Number of veterinarians actively engaged in some type of veterinary service:

In employ of U. S. Department of Agriculture	64
In the military service	76
In employ of municipal health departments	37
In general practice	677
Total	854

Of these Ohio veterinarians, 19 have served the animal industry or public health of the state for more than half a century. Their names, schools from which graduated, years of graduation and addresses follow:

E. W. Brumter, ONT '93, Alliance.
Louis P. Cook, CIN '95, Dent.
H. G. Daily, OSU '94, Danville.
J. E. Foster, ONT '91, Coshocton.
H. W. Fulstow, ONT '92, Norwalk.
W. H. Gribble, AMER '84, Marietta.
O. B. Hess, NAT '94, Fostoria.
O. E. Hess, OSU '85, Elyria.
J. B. Hollenbeck, ONT '95, MCK '00, Columbus.
T. L. Kelly, ONT '96, Port Clinton.
W. E. Krieder, ONT '94, Wadsworth.
W. E. McBain, CVC '94, Toledo.
A. E. Metzger, CVC '93, Clyde.
A. E. Miller, ONT '95, Uniontown.
J. P. Norton, CVC '90, Sandusky.
O. F. Nugent, ONT '87, Cleveland.
Fred Priest, OSU '95, Newark.
M. W. Tritchler, AMER '88, Cincinnati.
W. B. Washburn, ONT '93, Tiffin.

J. B. HOLLENBECK

Columbus, O.

American Veterinarians Visit Royal (Dick) Veterinary College

Recently a number of American Army veterinary officers stationed in Britain attended a special, six-day course of lectures at the Royal (Dick) Veterinary College in Edinburgh. Lectures in which the American veterinarians were particularly interested were: (1) The Streptococcus group, (2) Pathology of bovine tuberculosis, both gross and microscopic, (3) Liver fluke in sheep, (4) Endocrinology and recent concepts of androgens and estrogens, (5) Microscopic anatomy of the genital tract of the dog and the cow during the four stages of the estrous cycle and (6) Skeletal diseases of the horse.

In the lecture on the genital tract it was brought out that the ciliated epithelium of the fallopian tubes in cattle becomes desquamated during estrus and the fallopian tubes contain an abundance of mucin produced by cells in the basement membrane of the mucosa. At about three months of prenancy the vaginal vault is thickly studded with a submucous layer of goblet-like cells.

The lecture on skeletal disease was by Professor Wm. Mitchell. Illustrations were shown of clinical cases and of the skeletons of the same cases, and microscopic slides of the main nerve trunks of the limbs. Changes in the vertebral axis, degeneration of nerve trunks to the limbs and side bones, navicular disease, spavin, etc., consistently went together, and agreed with the photographs of the animals during life.

Benefits of War

War is a disaster so terrible that one is apt to think that no benefits can be derived from it. Certainly none can that in comparable percentage offset its cost in men and matériel—and suffering. It is only the fate it avoids that justifies war. However, much of the progress in science and invention, particularly in the general application of the achievements of science, have come about as a result of war. More important, much of the collaboration, the art of living and working together that makes civilization possible stems from the hard lessons of war.

The present standing of the veterinary profession is in no small measure a result of advances gained in governmental and public estimate during war or as a result of war. Each of our wars in the past 100 years has marked for veterinary medicine a long step forward in the public's acquaintance with it and appreciation for it. This by reason of its contribution to the public welfare in times of emergency.

The sobering effects of time are required to weigh whatever benefits the world may derive from the war. For the moment, the emotions are overwhelmed by the thrills of victory, the horrendous atrocities of our enemies and the incalculable cost in grief and life.

In our field, it is not, however, premature to point out that World War II has given augmented values on both the military and the civilian veterinary services. To the credit of the war there can be registered the vast fund of knowledge on exotic animal diseases and parasitisms which the Veterinary Corps has gathered from far-flung parts of the world, on the importance of economic and pathogenic entomology, and on the advancements in chemotherapy. But much the greatest benefit from which the world will profit is the new relationship securely established between veterinary science and food hygiene. As the Central Pacific Service Command (Hawaii) declares in a recent release, *"The Veterinary Corps works so efficiently that the Army's veterinary program, though little publicized, becomes one of the most valuable projects of the war."* Compliments of this type from high places are so numerous that a new pattern of food inspection, postwar, is predictable.

A wartime benefit that should have a wholesome effect, but is likely to be undervalued at present was abolishing the dog-food testing program once sponsored by the A.V.M.A. but allegedly stopped as a war emergency. Figuratively speaking, the dog-food testing program in original form put the hard-won honor of the veterinary profession on sale at so much per "seal of approval" and also cast doubt as to the veterinarian's qualification as a food inspector. There can be no alternative implication. In effect, a profession stuggling to uplift itself under well-known obstacles was about to join the money changers through the strange idea of offering to test the products of a big industry at a stipulated price per can, contrary to the customary morals of the learned professions. One need not mention the presumption that the manufacturers of dog foods were a scheming group of mercenaries who ought to be watched lest their scientists and their veterinary inspectors default and their salesmen peculate to the disadvantage of the dog population.

Stopping of this program from within the veterinary profession is truly a benefit derived from World War II. As a chapter of American veterinary history it was just a blotch, stopping it, a credit to demure vision. The veterinary profession can hardly afford to reduce itself to the level of cashier for nutritionists chosen to show up its incompetence in the field of food inspection, where its sixty-year-old meat inspection service for civilians at home and of its Army Veterinary Corps all over the world have made a reputation in which we may take justifiable but never boastful pride. In its insinuation the dog-food testing project takes the cake, easily. The implication that the veterinary profession had to go outside its membership to obtain the competence necessary to inspect dog food, while demonstrating its capacity to supply a superior inspection service for human food, should take first prize in any bonehead contest. Possibly this implied admission of incompetence is responsible for short articles that have appeared in two dog magazines recently, proclaiming that "veterinarians are poor dietitians," because their training and experience is to care for sick dogs; not well thrifty animals.

Fortunately, this seal-at-a-price scheme in which luscious fees to distribute were envisioned, but never realized, was checkmated in adolescence, and finally killed by the war. Like the war itself, it was the child of an age of greed and grandeur. May it not again threaten and may the competence of the Bureau of Animal Industry and of the Veterinary Corps never again be tarnished from within the veterinary profession.

These are some V-E Day thoughts for us to ponder in planning to continue, postwar, the honorable record mapped out and pursued by the veterinary profession throughout the trying years of its short history.

Signal Corp, U. S. Army

Major Charles R. Smit, V.C., of Alton, Iowa, Island Veterinarian, Saipan, inspecting captured Japanese rations. Millions of pounds of captured rations have been inspected by veterinary officers on various Pacific islands. Battle damage, bad weather and lack of warehouses made food salvage a major problem. Captured foods were used to feed civilians in occupied areas

A Story of Captured Food

Some crabmeat was captured and the following is the report from naval sources concerning it:

The labels on the box indicated that the cans of delicate white crabmeat had been packed originally by the Japanese—for the British Officers Club of Singapore. The Japs recaptured the seafood and sent it to their own officers club on Saipan. The United States Marines captured Saipan, the enemy officers club—and the crabmeat. They presented the case of the rare food delicacy to a naval officer, Lt. (jg) William N. Trull, who is on duty with Service Squadron 10. The report from the Pacific, which relates this long tale of the crabmeat ends with these satisfying words:

"The story can go no further—we have eaten it all."—*Reserve Officer.*

* * * *

War Dog Recruitment Lags

The total number of war dogs as of 1 May 1945 was 3,357. Of this number 1,368 were at the War Dog Reception and Training Center, Fort Robinson, Nebraska, and 1,989 were assigned to the various Army units in this country and in overseas commands. In connection with the procurement of 1,500 additional dogs required for the development of infantry dog platoons desired by the Army Ground Forces for use with combat infantry divisions, the Office of The Quartermaster General reports that of the 58 animals received to date at the War Dog Reception and Training Center 14 have been rejected as unfit for service.

It is expected that in the near future sufficient numbers of serviceable dogs will be made available from civilian sources to insure the success of this program.

Signal Corp, U. S. Army

CHIEFS OF THREE VETERINARY SERVICES IN TERRITORY OF HAWAII

Left to right: Dr. E. H. Willers, Territorial Veterinarian; Col. W. O. Kester, V.C., Pacific Ocean Areas; Dr. A. A. Julian, B.A.I., Inspector in Charge

Signal Corp, U. S. Army

WILD GOATS ON SAIPAN

The ubiquitous goat is found on practically all captured Japanese islands. Of no particular value, they have been rapidly liquidated by slaughtering them under Army Veterinary Corps supervision for food for civilian consumption in the occupied islands. Veterinary postmortem inspection, and tuberculin and brucellosis tests have proved the goats to be healthy and generally disease free

The War Department and Surgeon General Kirk report that use of DDT and atabrine has been primarily responsible for lowering the incidence rate of tropical diseases in the armed forces.

Malaria has been reduced to one-fourth that early in the war and the death rate from this disease is now .01%. Atabrine has been found more effective as a therapeutic agent in the control of malaria than quinine.

Signal Corp, U. S. Army

AMPHIBIOUS TRAINING OF PACK TROOPS IN THE HAWAIIAN ISLANDS

An army mule being unloaded from an animal transport onto a L.C.V.P., by means of a sling. When a sling is used to lower an animal into the landing craft, it should be rigged with a breast plate, breeching and guide lines. The use of the sling in unloading animals is much faster and simpler than the "flying stall"

Army Horses and Mules in Service

Veterinary reports of sick and wounded Army animals indicate the total animal strength of the Army to be 43,599—27,384 horses and mules were at posts, camps, stations, and remount depots in the United States and 16,215 in the various overseas commands.

Maj. James C. McIntyre, V.C., Colorado State College '37, is serving with a unit of the Chinese Combat Command in China.

Major McIntyre, a member of the Officers' Reserve Corps, was engaged in research for the U. S. Department of Agriculture at Beltsville, Md., before being called to active military duty. He was stationed at Maxwell Field, Ala., until ordered overseas, arriving in India in April, 1944, where he served as staff veterinarian. In August, 1944, he was flown across the Himalayan "Hump" to China and joined the American military mission which helped train, equip and supply the Chinese Expeditionary Force in its successful Salween campaign, which made possible opening of the new Stilwell Road.

The Medical Department of the Army numbers in excess of three-quarters of a million men and women. There are 137,700 officers, 535,000 enlisted personnel and 80,000 civilian employees.

Meritorious Service Award

A star in lieu of a second Meritorious Service Unit Plaque was awarded to the Veterinary Food Inspection Detachment of the 1745th Service Command Unit, Fort Omaha, Nebraska, July 2, 1945.

In the six months following the first presentation of the Meritorious Service Unit Plaque, the officers and men of this unit have functioned with the same high professional efficiency and enthusiastic attention to duty which was described in the original notice of award.

By command of Major General Danielson.

Crude Penicillin Applied Locally

Fisher treated 95 cases of various types of infections with crude penicillin locally. The results were good in 63%, indefinite in 24% and poor in 13%. The lesions which have shown the best response were the more acute or subacute lesions in which the bacteria are superficial, or chronic lesions following surgical drainage with removal of all dead tissue. Local penicillin therapy is not recommended to the exclusion of other methods but can be employed successfully in conjunction with its parenteral administration, with local surgical measures or with other antibacterial agents.—*Bul. Johns Hapkins Hospital*, 76:9, p. 154. 1945. Abst. in *J. Am. Med. Assn.*, 128:10, p. 764. 1945.

Treatment of Compound Fractures of Femur with Penicillin

Burns and Young, referring to practices in the British army, say that when a débridement has been done some days previously the use of penicillin makes it possible to suture infected and purulent wounds. Penicillin does not have so dramatic an effect on local sepsis as it does on the prevention of its spread, but that prevention is absolute. There were no deaths, no amputations and no septicemia in the 70 cases of compound fracture of the femur treated by the authors since D day, June 6, 1944. The great majority of patients reached their hospital between the third and the tenth day after infliction of the wound. All came in Tobruk plasters, having had débridement of the wound, the wound being left open. Nearly all the patients had had some penicillin before arrival, but the doses in transit varied within wide limits. After 24 hours' rest the plasters were removed under anesthesia and the wounds were inspected. Nearly all had a sulfonamide petrolatum gauze pack. Pus in varying degrees was present in most of the wounds. In some the pack had become a plug and was damming up the pus. Complete closure of the skin gave the best chance of early healing and avoidance of bone infection and, whenever possible, the wound was thereafter sutured completely, regardless of the amount of infection present. The suturing was not determined by bacteriologic findings but on anatomic grounds alone. Of 48 cases completely sutured, 40 healed in a month; four more healed at three months; four failed and had a sinus at three months. Of 17 which could be only partially closed, 11 were healed and six had a sinus at three months. Of five cases which had to be left completely unsutured two were healed and three had a sinus at three months. Thus only four of the 48 completely sutured had a sinus at three months against nine of the 22 incompletely closed. Union of these compound fractures proceeds as quickly as in closed fractures or even more quickly. Penicillin has justified itself in the treatment of compound fractures of the femur. It is expected that from 40 to 50 will eventually show no disability from the fractured femur. —*Lancet* (London), Feb. 24, 1945. Abst. in *J. Am. Med. Assn.*, 128:6, p. 468. 1945.

In an investigation to determine if penicillin is eliminated in the milk of cows which have been given large doses of the drug intravenously, research workers at the Storrs experiment station, found that it is not. This supports the experience of Bryan[1] that intravenous injections of penicillin are ineffective as a treatment for mastitis.

In a release June 20th the War Production Board stated that the monthly production of penicillin has attained the enormous aggregate of 650 billion units per month. The amount used parenterally in human and veterinary medicine approximates 220,000,000 units monthly. Export for June was estimated at 135 billion units. The remainder is available for peroral and topical use.

Buy War Bonds—to have and to hold

Mink Grubs

Larvae of the spiny flesh fly, *Wohlfartia vigil*, one of the large group of myiasis producing flies frequently infest young mink. The adult female is viviparous and the minute larvae when deposited in the short fur of young kits crawl about actively and soon penetrate the unbroken skin and begin development immediately underneath it.

The larva grows rapidly, causing a swelling similar to that caused in cattle by grubs, but smaller. There is an opening in the center of the swelling, usually about one-sixteenth of an inch in diameter which is surrounded by moist fur. The grubs cause great discomfort to the mink kits, which is manifested by frequent cries of distress.

The larvae may be removed with small, slender-jaw thumb forceps. As more than one larva commonly inhabit the swellings careful search should be made of the cavity beneath the skin. A drop of 5% argyrol solution deposited in the cavity after removal of the grubs is thought to lessen bacterial activity and favor prompt healing. The best preventive of the grubs is screening the mink kits from flies.

[1] Bryan, C. S. Penicillin in the treatment of chronic streptococcic mastitis. *Vet. Med.*, 40:3, pp. 87-89. 1945.

Investigations indicate that sufanilamide inhibits the secretory ability of the shell glands in poultry with resultant soft-shelled eggs.

* * * *

It has been found by investigators at Cornell and others that about 16% protein in the total ration is essential for the highest egg production.

* * * *

In 1943 frozen egg production in this country was 412 million pounds and dried egg production 262 million pounds. Production in 1944 exceeded this total in the first seven months, being 451 million pounds of frozen and 211 million pounds of dried eggs.

* * * *

Brucella Suis Transmitted by Boars

Brucella suis has been found to be most commonly transmitted by boars infected in the genital tract. At the Animal Disease Station, 70% of gilts bred to known infected boars contracted the disease. Abortions in the first six weeks of pregnancy may pass unobserved. Infection in sows is less persistent than in boars and in young pigs from infected sows. Infection is particularly persistent in boars infected in the genital tract, while in young pigs infection may persist for as long as four months after transfer to clean premises. Vaccination of pigs against swine brucellosis shows that an active resistance can be etablished. The vaccine used was prepared from *Br. abortus* and *Br. suis* cultures of low virulence. —*Rept. of Chief of the B.A.I.*

* * * *

Seasonal Distribution of Anaplasmosis Cases

Forty-three Kansas veterinarians reported 1,620 cases of anaplasmosis as occurring in their practices during 1944. More than half the cases occurred during August, September and October with less than 5% of the total during February, March, April and May. The number of cases occurring in the remaining months was fairly evenly distributed; thus in midwinter (January) there were 93 cases reported and in midsummer (July) 98 cases. Since in the latitude of Kansas the activity of insects largely ceases by the end of September and of arthropods in early November, the year around occurrence of the disease seems to cast some doubt on the theory that ticks and perhaps mosquitoes and biting flies are the only natural vectors of the disease. The treatment most commonly used in the cases reported was sodium cacodylate. The mortality ranged up to 75% and averaged 22%.—*Kansas Vet. Med. Ass'n Bul.*

Unsoundness in Horses

Under the main heading of osteoarthritis, I included[1] stringhalt, shivering, roaring, grunting, sidebones, ringbone, bone spavin and thoroughpin; as I am convinced these are all local manifestations of the same generalized condition. It is a common experience that if one of these conditions can be found in a horse, then, very probably, on closer examination, further ones will be revealed. It is uncommon to find only one of these conditions in an animal, except perhaps a young horse, in which case, as the animal grows up, other conditions develop until, by the time it is six years of age, the animal will be a regular collection of these local manifestations of disease.

* * * *

Vesicular Diseases of Animals

Vesicular exanthema has been prevalent in swine on the West Coast for more than a decade. Fotunately, this disease has been restricted thus far to California. Both vesicular exanthema and stomatitis, which frequently so closely resemble foot-and-mouth disease as to be clinically indistinguishable from it, are established in this country. Foot-and-mouth disease has not occurred here since the last outbreak in 1929, when it was eradicated through prompt slaughter and destruction of affected and exposed susceptible animals. One of the major objectives of livestock sanitarians is to keep this foreign plague out of the country.—*U.S.D.A.*

* * * *

Improvement in Cheese Quality

For several years the Bureau has advocated that all milk intended for cheese making be graded; and also that it be pasteurized, regardless of quality, in order to enable the cheesemaker to control the making process more exactly. Cheese manufacturers generally are adopting the Bureau's method as rapidly as the availability of pasteurization equipment will permit. Introduction of the method in seven states that are producing cheese for shipment overseas has resulted in a marked improvement in the average grade. The work in Minnesota and Indiana has been practically completed and the results tabulated. In the Minnesota factories that were assisted by Bureau field men, the average percentage of U. S. No. 1 cheese was increased from 36% in 1942 to 99% in 1943. The production of U. S. No. 2 cheese in the same period decreased from 36 to 0.85%, and the production of undergrade cheese decreased from 27.8 to 0.12%.—Ann. Rept. Chief, Bureau of Dairy Industry, U.S.D.A.

[1] W. G. Robinson in the *Veterinary Record.*

Pressure Effect on Hatchability

In a test made at the Bureau of Animal Industry Experiment Station, Beltsville, Md., the hatchability of eggs maintained at reduced atmospheric pressure for 36 hours, was unaffected until the pressure was reduced below one inch mercury. The test was made to determine if lowered atmospheric pressure in eggs transported by airplane would affect the hatching. The conclusion was that the hatching of eggs is not affected by elevation up to 78,000 feet when maintained for not more than 36 hours.

* * * *

From a study of more than 13 years, the Maryland Live Stock Sanitary Service found that among 20,547 birds submitted for examination the percentages of poultry diseases were as follows:

Parasitic and protozoan	42%
Infectious diseases	18.2%
Non-infectious diseases	15.2%
Miscellaneous diseases and conditions	17.8%
Nutritional diseases	4.7%
Poisoning (botulism, etc.)	2.1%

These percentages may not be applicable in other sections as some diseases are quite serious in certain areas but cause negligible loss in others.

* * * *

Mode of Spread of Pullorum Disease

Salmonella pullorum may be spread in the following ways:*

1. From the ovary of the hen to the egg to the chick.
2. From infected eggs and chicks through contaminated incubators to other chicks.
3. From chick to chick in shipping boxes, brooders, yards, etc.
4. From chick to chick through contaminated water and feed.
5. From infected adults to chicks and vice versa by direct or indirect contact.
6. By caretakers carrying the germs on their shoes, clothing or contaminated feed bags and utensils.

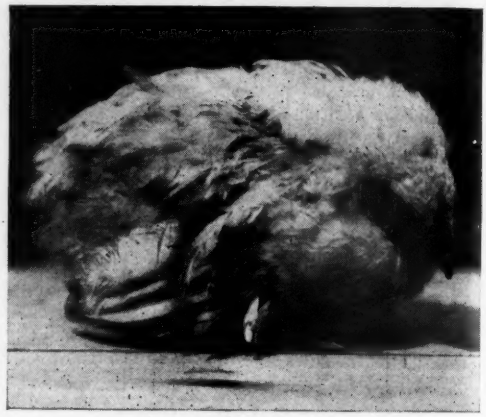
Infected droppings, infected broken eggs, carcasses of infected chicks or adults, left to be eaten by cannibalistic members of the flock, are important sources of infection. The same is true of down and dust in incubators and brooders, which may have become contaminated. Chicks infected through contaminated down and dust often develop infection of the respiratory tract and may spread infection with discharges from the nostrils and mouth. —*H. J. Stafseth* and *C. W. Darby.*

*All this applies equally to chickens and turkeys.

Use of Boron in Chick Coccidiosis

Sodium borate (borax) in the control of coccidiosis in poultry was reported by the U. S. Bureau of Animal Industry following a study of experimental exposure in which sodium borate was used in both the chick mash (at rate of 2%) and in the drinking water. Further trials were suggested, however.

An outbreak of coccidiosis occurred in a



Chick suffering from coccidiosis

flock of 300 eight-week-old White Rock cockerels. Two of the birds had succumbed and were examined post mortem. Paling and shrinking of the combs and wattles were noted in 32 other members of the flock of which 16 manifested the symptoms of an advanced stage of the infestation. The two birds necropsied showed considerable hemorrhage of the ceca. Microscopic examination was not made for oöcysts as the appearance of the affected birds and the hemorrhagic state of the ceca of the two dead birds indicated a typical *Eimeria tenella* infestation.

Sodium borate was administered in the drinking water, 0.3% (approximately 1 tablespoonful of Borax, U.S.P. to 1 gallon of drinking water). This was continued for a period of four days, following the outbreak, with solution changed daily. No more fatalities resulted and the outbreak was arrested. The 32 birds suspected of heavy infestation showed marked improvement in 48 hours. The flock was marketed a month after this treatment. Litter was not changed after the administration of sodium borate. This therapy should prove to be not only efficacious in controling an outbreak of coccidiosis but labor saving to the poultryman, who in the past has employed "flushings" with daily changes of litter being compulsory for at least 10 days following treatment.—*H. J. Mostyn.*

"GI" Loans for Buying or Starting a Practice

By HAROLD J. ASHE
Los Angeles, California

A GREAT American humorist of another day once said that the trouble with people was not that they knew too much, but that they knew too much that was not so! Had he been alive today and writing about the so-called G. I. Bill of Right he hardly could have made a more apt observation.

Even before President Roosevelt signed the bill making the Servicemen's Readjustment Act (Public Law 346, 78th Congress) the law of the land, well-intentioned but ill-informed writers rushed into print with glowing pictures of a veritable utopia for the returning battle-weary veterans. Such articles have contributed considerably more heat than light upon a subject which, at best, is difficult to understand. Already too many business men and veterans and wives and relatives of men and women still in service have been led to believe that the Act implicity promises every returning serviceman a stake with which to start any conceivable business venture of his choice.

In city after city, incidents have been reported in which sadly disillusioned veterans have made demands for $2,000 with which to start businesses. They wearily quote garbled curbstone versions of the Act as evidence of their right to such funds.

"It is surprising how many veterans believe that the federal government has promised to lend each man $2,000," lamented the vice-president of a large western banking institution.

This bank, incidentally, has approved only two G. I. loans to veterans for business purposes, so far, and these await veterans administration approval. In the city of Los Angeles there are already some 65,000 World War II veterans. Army surveys show between seven and 11% of all servicemen desire to establish a business. This would indicate at least 4,500 such potential businessmen-veterans in this city, alone. Yet, as this is written, exactly one G. I. business loan has been completed in Los Angeles!

Misconceptions

Before attempting to show precisely what the business loan features of the G. I. Bill of Rights are and how to go about getting such financing, it is necessary to clear up certain widely held misconceptions.

1. Probably the most widely held misconception about the G. I. Bill, not only among veterans but civilians generally, is that the loan feature of the Act is a sort of bonus or adjusted service pay decked out in new legal garb. Neither Congress nor veterans' organizations held any such belief in passing or supporting the Servicemen's Readjustment Act of 1944 and the latter specifically have reserved the right to press for a bonus or adjusted service pay at a later date.

2. The government does not advance any government funds for the establishment of veterans businesses, as such. This should dispel the notion that the government has $2,000 earmarked for each veteran after he has been mustered out of service.

3. While commonly called a Bill of Rights, the Servicemen's Readjustment Act in its loan features in particular (home, farm or business), might more properly be styled a G. I. Bill of *Qualified* Rights. That is to say, the veteran has a right to a loan only provided he is able to qualify by meeting the conditions prescribed by statute.

So, let's take up step by step the question of business loans—who may get them, and how!

Who Is Eligible

An eligible veteran is one who (a) served in the active military or naval service of the United States on or after September 16, 1940, and prior to the termination of the present war; and (b) has been discharged or released under conditions other than dishonorable after active service of 90 days or more, or because of injury or disability incurred in line of duty, even though less than 90 days and (c) makes application for benefits within two years after separation from service, or two years after termination of the war, whichever is the later date; but in no event more than five years after the end of the war.

The Act applies equally to women and to men who have served in the armed forces. In many instances, both husband and wife will be eligible for business loans and may, if they elect, pool their borrowing powers.

Who Makes the Loans

Contrary to popular belief, the government does not make loans for business financing under terms of the Act. The Veterans Administration merely undertakes to guarantee 50% of any loan up to a guarantee not to exceed $2,000. Thus, if the loan is for $1,000 the government will guarantee only $500. Moreover, in event of a loss sustained on the loan, the government undertakes to assume only its

share of the loss. That is, say a loan of $4,000 has been made on which the government guaranteed half or $2,000 and the veteran goes into bankruptcy and only one half of the original loan is recoverable. The government would sustain half of the loss on the $2,000 and the lending agency would assume the balance.

While the government sets a limit of $2,000 on the amount of the loan it guarantees, this does not restrict the loan to $4,000 as many have been led to believe. The lender may lend as much as he wishes, the government guaranteeing only up to $2,000 of the total loan.

It should be apparent at once that such loans cannot be entered into lightly and that good banking practice must be followed. In each instance, the lender is risking at least half of the loan—and at relatively low interest rates, too.

The loans may be made through regular banking channels: banks, building and loan associations or finance companies, insurance corporations or private individuals, even veterans' friends or relatives. To guard against excessive interest rates, the government will not guarantee any loan on which interest in excess of 4% annually is charged. To give the veteran a boost, the government will pay the first year's interest on that part of the loan which it guarantees. On a loan of $4,000 this interest payment by the government at 4% is worth $80 to the veteran. Thereafter, the veteran will pay interest on the full amount.

How Lenders Operate

The first hurdle the veteran must make in floating a loan is to convince the bank or other lending agency that he is a good business risk. The veteran must remember at the outset—and it cannot be stressed too many times that this loan is not a gift in any sense. He must be prepared to give credit references. While lenders, generally, may show extreme sympathy for the veteran-borrower, the latter must keep constantly in mind that the lender has much to lose, little to gain. The lender must assure himself, on behalf of his depositors —many of whom are also veterans—that the prospective borrower is a reasonably good risk.

The banker will want to probe impersonally into the veteran's background to find out what experience he has had in the business in which he proposes to engage. His reputation for integrity in the community may be a determining factor in granting a loan, other circumstances considered. An unbroken record for meeting financial obligations will weigh in the veterans' favor. Known bad habits of a veteran can count against him.

As for experience, let's amplify that point a little. This seems to be the key to the rejection of many applications. A veteran who, in civilian life had always been a bookkeeper, might be expected to have scant chance to engage in the furrier's trade. If, however, the veteran had worked in the trade as an employe before entering service, his chances for a loan would be enhanced. If he had held an executive position in the trade, better yet. And, provided he has that good credit rating before mentioned and had previously owned his own successful shop, his chances for getting a G. I. loan would be still greater.

If the lender approves of a loan to a veteran, he then forwards the application to the nearest Veterans Administration office which will check the veteran's eligibility on the basis of his service. Then the administration will check it in the light of its risk. If the loan goes through the Administrator will issue a loan guaranty certificate and send it to the lender and the loan will be completed by the lending agency.

Loans That May Be Guaranteed

The Administrator is empowered to guarantee a loan for the purchase of any business (or practice in case of a professional man), land, buildings, supplies, equipment, machinery or tools to be used by an applicant in a gainful occupation if he finds that (a) the loan will be used in the *bona fide* pursuit of such gainful occupation; (b) such property will be useful in and reasonably necessary for the efficient and successful pursuit of such occupation; (c) the ability and experience of the veteran indicate that there is a reasonable likelihood that he will be successful; (d) the purchase price does not exceed the reasonable value; and (e) the loan appears practicable.

Business loans are subject to guarantee by the government if made for one or more of the following fundamental purposes enumerated in the regulations: (a) loans for the acquisition of an existing business (including a practice in the case of a professional man); (b) loans for the purchase of equipment, machinery, or tools; (c) loans for the purchase of supplies; and (d) loans for the purchase of business realty (e.g., a hospital). Neither the statute nor the regulations cover loans for inventory, stock or working capital.

Buying a Going Business

In buying an already established business, loans will be approved only if the veteran is going to actively participate in the management and direction of the business. This precludes "dummy" set-ups in which a veteran's borrowing power is used to buy a business in which he may be only an inactive participant. such a business may be operated as an indi-

vidual proprietorship or as a partnership.

In all instances the purchase of existing businesses must include the transfer of good will. As a protection not only to the buyer, but the lending agency, in most instances the bill of sale will specifically forbid the seller from engaging in a like business within a stated period of time or within a geographical territory agreed upon between buyer and seller. This requirement will be very closely observed especially in the service trades so far as not in conflict with state laws governing such contracts.

While previously noted that the Act does not provide for loans covering inventory, stock or working capital, a loan for the purchase of an existing business would cover all assets, not only inventory, but working capital. However, loans for the acquisition of additional inventory or for other working capital are not eligible for guaranty.

The ultimate maturity of loans for purchase of existing businesses may not exceed five years.

Buying Equipment

Loans may be granted for the purchase of new or used equipment, machinery or tools with a maturity limitation not exceeding three years for the entire purchase price. Or a loan may be made for the initial payment on such items, not in excess of one-third of the purchase price, such loan not to exceed $1,000. An initial-payment loan may not be in excess of one year if for $500 or less, or two years, if over $500.

The amount of loans is not restricted to the above amounts, however, where a loan covers the full purchase price.

Buying Supplies

A loan may be granted for the purchase of supplies in an amount not in excess of $1,000 with a maturity of not over one year.

Buying Business Realty

Loans may also be made for the purchase of business real estate, land or buildings, or both, to be used by the veteran in pursuing a gainful occupation. Such loans must be amortized, principal and interest, within not more than 20 years.

Security for Loans

Generally, veterans' loans will be secured by first liens, although the Veterans Administration recognizes that a certain amount of latitude may be desirable. Supplies, for instance, being expendable may be unsecured.

Appraisals

Loan applications forwarded to the Veterans Administration must be accompanied by an appraisal of property which the veteran proposes purchasing. This is not only sound banking practice, but it also safeguards the financial interests of the prospective borrower.

It may be stated categorically that a loan for purchase of an existing business will be rejected if the purchase price is out of line with the appraised valuation. Owners of existing businesses trying to unload at inflated values upon unwary veterans will find few buyers among ex-servicemen, if the government is asked to guaranty the loan.

Veteran Partners

There is nothing in the statute to prevent two or more veterans going into a partnership and starting a new business or buying an existing one. Each veteran would be held responsible for his share of the loan, not jointly.

First Mortgage on Bonus

While the overwhelming majority of veterans seeking to go into business will do so in all sincerity, a few may see in the Act a chance to get something for nothing—may even qualify for such loans. The framers of the statute have not overlooked this possibility. Where the borrower defaults on his loan, the government retains its right to proceed against the debtor in the same manner that a private individual may do. The administrator is given broad latitude in this respect and may waive collection if the facts indicate the veteran is not at fault in his failure.

On the other hand, the Act provides that, if any bonus or adjusted compensation bill is passed, the defaulted government-guaranteed loan may be satisfied with money due to the veteran from such a bonus up to the amount of the unpaid loan.

How Businessmen Can Help

There's hardly a businessman who does not have a close friend or relative in service or recently returned. His rich experience can be invaluable to the veteran seeking an entry into businss. Both the attitude and the helpfulness of businessmen toward ex-servicemen can go far toward making his readjustment to civilian life either a happy one or one of bitterness and heartache.

He can counsel his veteran friend or relative with sound advice; he can point out the pitfalls and business booby traps; he can discuss the desirability of various locations; fundamental business principles that may not be safely violated. These and a hundred other things he can tell the veteran. The serviceman will be the richer; the businessman no poorer.

Says the Veterans Administration in connection with G. I. loans:

"It was the clear intent of Congress that all eligible veterans should have available to them the full benefits of Title III (loans for the Purchase or Construction of Homes, Farms and Business Property).

Veterans Guaranteed $100 Monthly While Starting a Practice

By HAROLD J. ASHE
Los Angeles, California

Probably the least known piece of legislation pertaining to veterans rights—certainly one of the most enlightened—is that by which self-employed veterans will be eligible for unemployment insurance benefits on terms comparable to that of job-seeking ex-servicemen.

Intent of such unemployment insurance aid to the new newly self-employed is to give veterans a hand during the first few trying months when, in many instances, even soundly conceived ventures may not permit of personal withdrawals and which, thanks to service, have less working capital than might otherwise be the case. The legislation will go far toward insuring ultimate success for such business venturers and may have the long range effect of making many veterans self-supporting who, otherwise, might be forced upon the relief rolls. After all, through no fault of their own, such veterans are either getting a late start in business or the professions, or have had such activity interrupted.

Wisely, the amount of the unemployment insurance to which the self-employed are entitled is limited to $100 a month, as compared to approximately $87 a month ($20 weekly) available to job-seeking veterans. The differential is hardly likely to inspire job seekers to become self-employed, so that those qualified as self-employed may be expected to be making a conscientious effort to be just that.

Who Is Eligible

To be eligible the applicant must have served in the armed forces at least 90 days unless sooner discharged for a disability incurred in service in line of duty; must have been on active duty after September 16, 1940, and prior to the termination of the present war, and must have been discharged or released from active service under conditions other than dishonorable. Benefits are payable only for a period not later than two years after discharge or release from active duty or the termination of the war, whichever is the later date. However, in any event, payments will not be made for any period commencing more than five years after the termination of the war.

A veteran who is self-employed in an independent establishment, trade, business, profession or other vocation is eligible for readjustment allowances if his net earnings are less than $100 for the previous calendar month, the amount of the allowance being the difference between his net earnings and $100.

How It Works

It works like this. Say a veteran is self-employed and after all business expenses have been met he has a net return available to himself of say $40. He would make application for benefits setting forth these facts and, in due course, would receive a check for $60, representing the difference between the maximum benefit and his month's net return.

Self-employed veterans claims for allowances for months of self-employment should be filed at the nearest public employment office in the same manner as though such applicants were job-seeking veterans applying for unemployment insurance. However, self-employed veterans will not be required to register for employment.

The period for filing claims for readjustment allowances for the self-employed is the first 20 days of each month for the previous month. At the time the first claim is filed the veteran's discharge or separation papers must be presented.

Length of Benefits

The amount of benefits that a veteran may draw under this Act is graduated upward from two months to one year, depending upon the length of the applicant's service in the armed forces. Within the one year limit, the total eligibility is determined by allowing eight weeks of benefits for each month of the first three months of active service, and four weeks of allowances for each month or major fraction, thereof, thereafter. For example, a person who serves from September 10, 1944 to May 5, 1945, would have eight months' service, entitling him to 24 weeks' benefits for the first three months, and 20 weeks benefits for the final five months, or 44 weeks' benefits altogether.

Claim Appeals

Where claims are denied, the veteran has recourse to appeal. If the claim has been denied by the local office he is entitled to a hearing before an impartial tribunal of the state agency. If adverse, this again may be appealed to the representative of the Admin-

istrator of Veterans Affairs, the Readjustment Allowance Agent. His decision also may be appealed to the Administrator of Veterans Affairs.

A veteran may not receive readjustment allowance for the same period that he is in receipt of subsistence allowance for education or training under Title II of the Act, or increased pension for vocational rehabilitation under Public Law No. 16 of the 78th Congress.

However, the veteran will not be ineligible by virtue of receiving pension, compensation or retired pay paid by the Veterans Administration.

Veterans Administration officials urge eligible veterans to exercise extreme care in taking advantage of the readjustment allowance provisions. They wisely point out that many veterans are strongly tempted now to take advantage of the unemployment benefits, even though work is plentiful—if not always in the veterans' preferred lines—thus prematurely exhausting their claims which may be of more value to them at some later date. Veterans contemplating starting or resuming businesses or professions in the future, but now unemployed job seekers might especially profit from this advice. That is, take work other than their first preference, rather than use up their readjustment credits.

The self-employed should guard their readjustment allowance time zealously. This time may be exhausted as easily by receiving a $5.00 differential in a month when the business nets $95 as in the receipt of a larger amount for another month where net return is considerably less. Veterans might well consider the advisability of not applying for readjustment allowances for months in which net earnings fall only slightly below the $100 figure. This will conserve their allowance time against months of seasonal slump or anticipated dull periods.

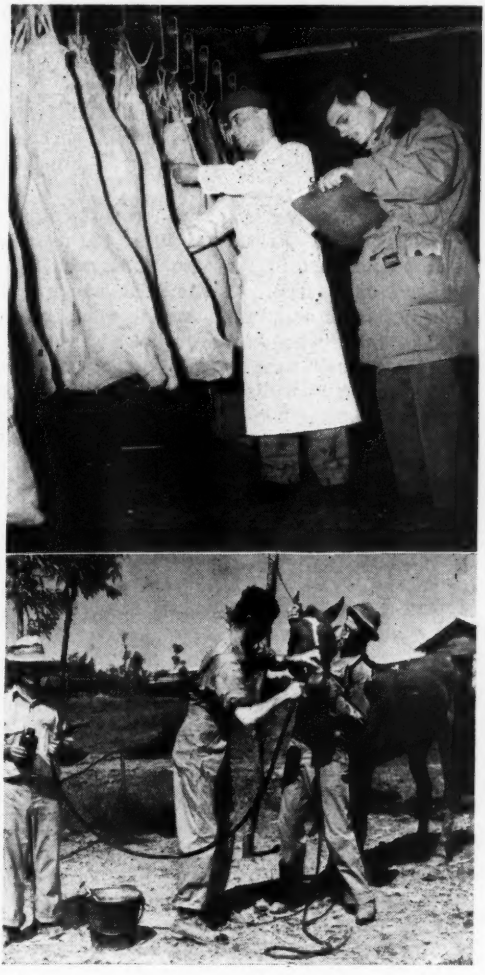
Word of Warning

Veterans should also be warned that the use of fraud in getting benefit carries all of the customary penalties for fraudulent acts. In addition, veterans may be deprived of all other benefits available to them.

Self-employed veterans receiving unemployment benefits should be prepared at all times to present intelligently kept books revealing all of the salient facts upon which their claims for such aid are based.

Needless to say, a veteran representing himself to be self-employed will not be eligible for such assistance if he is holding down some form of employment elsewhere while conducting a business or professional venture. The veteran must be literally self-employed and such self-employment may neither be of a part-time character nor be a subterfuge to get allowances to which he is not entitled. Uncle knows all of the dodges.

The veteran should also bear in mind that such allowances may be deducted from any future bonus or adjusted compensation pay that may accrue to him by some future act of Congress. It is not certain such an act will be passed; neither is to certain that unemployment payments will be deducted if such an act is passed. It is merely something to remember in making future calculations.



Signal Corps, U. S. Army

Above: Army Veterinary Corps meat inspection in Newfoundland. Below: In Australia, halfway around the world

Seasonal and Geographic Distribution of Vitamin A Deficiency in Cattle

By JOHN W. PATTON
East Lansing, Michigan

In preceding discussions,[1,2,3] an effort was made to make clear a condition in cattle that is primarily due to inadequate intake of vitamin A and secondarily appears to be due to impaired metabolism of fats and mobilization of dextrose in the blood; this dysfunction appearing to be due to vitamin A privation. As a result of these discussions, vitamin A therapy in dairy cows has come into wide and successful use in sections of the country where it is most needed.[4-11]

However, judging by certain reports of research workers[12,13] there is still an entire failure on the part of some to understand the ailment, as it occurs in the field, which has been described as vitamin A deficiency. In the case of those who discuss "ketosis" as a disease not much can be said for no one can even surmise what disease they are discussing, since ketosis, as at least practitioners know, is a symptom of many clinical and sub-clinical conditions in cattle and other animals, including man. It occurs in vitamin A deficiency but in the absence of other and more diagnostic symptoms of the deficiency, and particularly in the absence of the typical history of low intake of vitamin A or high output, or both, over a period, not of weeks but of months, only a tyro could conclude a disease is vitamin A deficiency because a test of the urine disclosed that it contained ketone bodies.

Etymologically, acetonemia (acetone in the blood) is not much of an improvement upon ketosis (ketone or acetone condition) as a name for vitamin A deficiency, but the former has the merit of long usage, and of being understood as referring to a definite entity in a large section of the country where the condition is most prevalent. One cannot diagnose vitamin A deficiency (acetonemia) simply by a urine test. The ailment is too complex for that. Few, if any, diseases can be diagnosed clinically by a single symptom. It is the syndrome and not a single symptom that establishes a disease entity and even when all symptoms are considered the history of the animal and, not infrequently of the herd also, is often necessary to a definite diagnosis. If, by means of a urine test, ketonuria is established, the condition is one of ketosis, but that does not establish a diagnosis. Ketosis is but a symptom of various conditions, some of which are not regarded as diseases at all. Most of the veterinarians who treat a large number of cases regard a test of the urine as unnecessary in the diagnosis of acetonemia, in fact, as no more indicative of this disease than it is of chronic milk fever, constipation, metritis, starvation, etc.

Both Shaw[12] and Sampson[13] have been at some pains, recently, to point that certain animals that they observed, and in which ketosis was present as a symptom, were not suffering from vitamin A deficiency. They have inferred from this that I must have erred in saying that ketosis is vitamin A deficiency. The inference is not only incorrect but wholly unnecessary as I have at no time stated that ketosis is vitamin A deficiency. On the contrary, I have repeatedly stated that ketosis is a symptom which is as common in various other ailments as it is in vitamin A deficiency. A research worker, of much greater experience than those quoted, recently told me that he sees many cases of ketosis that are not vitamin A deficiencies. Of course he does—so does everyone else. I told him he probably sees a number of persons who have a headache who are not suffering from undulant fever. We can accept the statements of Shaw and Sampson that their animals* were not suffering from

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[1] Patton, J. W., Acetonemia, a vitamin A deficiency. *Vet. Med.*, 39:4, pp. 150-153. 1944.

[2] Patton, J. W., Acetonemia, a vitamin A deficiency II. *Vet. Med.*, 39:7, pp. 271-278. 1944.

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vitamin A deficiency. They give neither history nor symptoms that would lead us to suspect that this deficiency existed in their animals, even if they had not mentioned the fact.

In the earlier discussions, to which reference has been made, I have been at pains to record the symptoms in great detail and to give the history fully, that readers might know exactly what condition was being discussed irrespective of the nomenclature employed. In a further effort to picture vitamin A deficiency (acetonemia) as it occurs in the field of dairy practice in various sections of the country, perhaps a chronological record of experiences encountered on one trip (the third) made for the purpose of studying this condition, will prove useful.

We left East Lansing in the middle of January. The ground was blanketed with snow and the animals were in barns. Proceeding south from Chicago, we crossed and recrossed the Illinois-Indiana boundary several times. The veterinarians we contacted reported no acetonemia, but some cases of ketosis. This is not acetonemia country, the feed is too good. Benton County, Indiana, is an exception and for a peculiar reason. Here we found acetonemia a very real problem to both the veterinarians and the dairy farmers. Benton is perhaps the foremost corn county in the corn belt. It has a reputation, of recent origin, for acetonemia. One dairy farmer, whom we visited in company with his veterinarian, had the following explanation for its occurrence: "Our pride is corn; that comes first. Being on the edge of the Chicago milk shed we go in pretty heavy for dairying also. Our cows are mostly Jerseys. During the past two years our hay has been atrocious—due to lack of labor. Haying had to give way to corn plowing and consequently our hay was the world's worst."

When I reminded him I had seen the world's worst hay in Mississippi and Alabama, he remarked, "Never been there, but surely ours, in this vicinity is the world's second worst. But," he continued, "my mind is made up on how to avoid acetonemia. I am going to plant 12 acres of alfalfa and get some good hay and pasture. I never was bothered with acetonemia until I quit raising alfalfa."

Another dairy farmer in the same community to whom I repeated this man's ideas remarked, "Come to think of it—I believe Claude is right. I had no trouble when I fed good alfalfa hay and had good pasture."

Approaching the Kentucky boundary we ran out of the snow. Both acetonemia and ketosis were recognized by veterinarians in southern Indiana and southern Illinois, but this season (1945), up to January 30, acetonemia had not yet made its appearance. There was a decided change in conditions here. Most of the cattle were running out, although the pastures were dry.

In Michigan, northern Illinois and northern Indiana the roughage the cows received had to be fed to them and, with few exceptions, it was palatable and nutritious. Here in the Ohio River country, they ate the dried up pasture, grass and weeds and, even where good roughage was fed to the animals at night, they had filled up on a lot of poor, non-nutritious roughage during the day and, hence, consumed less of the good article than did the cows in the snow-covered north.

Kentucky is the northern border of what for convenience has been referred to as the "acetonemia belt." As we traveled south through Tennessee, traversing the state from east to west meanwhile, acetonemia became more of a problem—though it had not, as yet, reached its peak for this season nor its usual severity. The conditions, however, were conducive to acetonemia: no snow blanketed fields, cows eating dried up pasture and the distance from an adequate source of good leguminous hay was increasing.

In north Mississippi, acetonemia was a major problem with the veterinarians we contacted. This area and east to the Atlantic seaboard and west to Oklahoma is the center of the author's conception of the "acetonemia belt," which lies roughly east of a meridian through central Oklahoma and between parallels 31° and 37° north latitude. Acetonemia, of course, occurs anywhere that the proper conditions prevail; as, for example, in Benton County, Indiana, or in Lafayette Parish,[14] Louisiana, to which reference will be made later. Northern Mississippi and Alabama is a region of good cows, notoriously poor native hay, open winters, dried up pastures and very poor shipped-in-hay. By the first of February, however, acetonemia was not nearly so serious this year as last year, in the Corinth and Tupelo areas; being later by fully 45 days in reaching its height than it was the preceding season (1944).

We traveled southwesterly to the Mississippi River, then east across the Mississippi Delta and Alabama finding sufficient acetonemia all the way to make it interesting. Doubling back to Louisiana, we entered a district where acetonemia is relatively unknown.

As the crow flies, it is approximately 275 miles from Corinth to McComb, Mississippi. In Corinth, there was no growth of vegetation in February; in McComb, the daffodils and

[14] Dr. J. J. Martin, Lafayette, Louisiana, furnished this information and added: "Lafayette and its environs is the hot spot for acetonemia in Louisiana." This is confirmed by several other veterinarians.

hyacinths were in blossom and pasture was sprouting. Corinth, ordinarily, is a hotbed for acetonemia; in the McComb area, there is relatively little. There is an average difference of 64 days in the length of the growing season as measured from last to earliest killing frost in north and south Mississippi.[15] This is important in determining the incidence of acetonemia which ordinarily occurs when the animal has been taking in less vitamin A (or carotine) than it has been putting out over a *long* period.

As one travels farther into Louisiana one finds a greater profusion of flowers, grass and shrubs and less acetonemia. In the New Orleans milk shed veterinarians rarely see acetonemia, while those in the Nashville and Memphis milk sheds regard it as one of their major problems. It is not a coincidence that veterinarians in north Mississippi see more cases of acetonemia in a day, than veterinarians in Louisiana, with equally large practices, see in a lifetime.

However, there is one spot in Louisiana—Lafayette Parish—where we found considerable acetonemia. The area is very fertile and highly cultivated. What pasture there is, is relegated to land not fit to cultivate nor good for much of anything. Here, too, as elsewhere, in districts in which acetonemia is prevalent, we found the hay to be of notoriously poor quality. The practice is to put it in small cocks and leach it after what is called the "gazon method."

In the northern half of Florida we found acetonemia wherever we found milk cows. This posed a puzzling question. Farther north the incidence of acetonemia is in inverse ratio to the amount of green winter vegetation, which is to say, to the availability of carotene. The occurrence in Florida differed from the pattern in the acetonemia belt. In the latter, acetonemia occurs mainly in the small farm herds, which are fed principally on home grown feed, and is seen only rarely in large dairies which feed chiefly commercial feeds. In Florida, particularly in the Tampa and St. Petersburg areas, the incidence of the disease is very high in the large commercial dairies engaged in supplying fluid milk to the cities.

It always pays to investigate the history when any vitamin deficiency is suspected. In this case, as usual, it supplied the answer. Florida dairymen were importing their acetonemia and paying a high price for it. Dairying is a highly specialized industry in these areas; the aim being to produce the greatest possible amount of milk during the winter tourist season and still have the smallest number of cows which it is practical to feed during the slack summer season. No calves are raised. The cows are forced to the highest possible production and their productive life is short. Replacements are acquired as heavy springers, almost parturient cows, chiefly from farm herds in Alabama, Mississippi, Tennessee, the Carolinas, and Georgia—deep in the heart of the acetonemia belt. They are far along in vitamin A depletion when acquired. Superimposed upon this is the exhaustion of the rail journey, new surroundings at destination, radical change of feed, parturition, colostrum production and lush milk flow. A minority of these imported replacements come from Ohio and other northern states. We found no cases of acetonemia in these latter animals. By contrast, in one dairy, near St. Petersburg, an entire carload of springers originating from within the acetonemia belt was affected, as they freshened, with acetonemia, or acetonemia and its complications, not an animal in that carload escaped the disease.

It is the practice of these dairies to feed chopped hay, peanut straw, copra and what they call alfalfa as roughage.

To summarize our observations to this point:

1. Acetonemia occurs in all sections of the country; it is most prevalent, however, in the section referred to as the "acetonemia belt." This is an area with relatively open winters, during which the cattle are expected to exist, to a great extent, on dried up pastures and weed lots and without, quantitatively or qualitatively, adequate roughage. Further, it is an area where hay must be shipped in and in which the hay is often, if not as a rule, of poor quality. The pasture, on the whole, is inadequate both in quantity and in quality. Except for periods in the spring and fall, the pastures are either burned up (in the hot, dry summer) or dried up (in the winter). It might facilitate our description to divide the country into three zones from north to south and to call them north, central and southern.

In the north zone the cattle are, as a rule, barn fed, following relatively good pasture conditions.

In the central zone (acetonemia belt) pasture conditions are not good, neither is the roughage which is fed, and the animals are permitted to forage a good portion of the year on dried up or burned out vegetation.

In the southern zone pasture conditions are relatively the best and while the roughage fed may be no better than it is in the central zone there is a longer growing season and a shorter dry-feeding period.

The type of roughage produced in a given

[15]Average growing season: Corinth, April 1 to Nov. 1; Biloxi, Feb. 20 to Nov. 25.

area is, of course, a product of the soil, temperature, moisture and farm practices of the region. These supply a guide to the quality of the roughage. In the northern zone the soil is generally good, the temperature and moisture are favorable to a good balance between pasture and hay. The growing season is longer in the central zone, but there is a burned-out period between spring and fall pasture and there is a scarcity of good hay. In the Southern zone, the temperature is suitable but soil and moisture are often unfavorable for production of either good pasture or good hay. In Florida, for instance, there is a favorable temperature but the soil fertility and moisture are inadequate and acetonemia is prevalent. In Louisiana there is rich soil, plentiful moisture and a long growing season, and no acetonemia.

In brief, acetonemia, i.e., vitamin A deficiency in cattle, is an ailment definitely associated with a lack of good pasture and/or good roughage. However the conditions that conduce to vitamin A deficiency are mutable. An unusually late killing frost, a wet summer, a rainy fall or clear weather at haying time following a good growing season will change the picture.

It is common knowledge that a high incidence of acteonemia is well defined both as to geography and to season. In the acetonemia belt the disease is usually at its height in incidence from December 15 to April 1. This was the situation in the winter of 1943-44 when much of the same route was traversed. As previously stated, during the winter of 1944-45, acetonemia did not become prevalent until eight to ten weeks later and the incidence was not nearly so high as in the preceding year. Also the cases were milder. The explanation lies in the weather. In the fall of 1943 killing frosts came unusually early—soon after the autumnal equinox. In 1944 they did not occur until after December 15; eight to ten weeks later. Hence, some green forage and, as a consequence, some vitamin A was available for an unusually long period in the fall of 1944. Furthermore, the spring and summer of 1944 was very favorable for the growth of hay and the native hay fed in the winter of 1944-45 was much better than the average. But at that it was not good, only fair.

Taking the Corinth (Mississippi) area as an example: January 1 to April 1, 1944, was an average year for acetonemia. The incidence was very high, as has been told heretofore,[1,3,4] up to April 1. But 1945 was an unsual year in that there was much less acetonemia than in any other recent year. A more convincing demonstration of the value of a long pasture season, a short period on dry feed and better roughage in the prevention of vitamin A deficiency could hardly have been arranged. The 1943 hay crop was scarce and poor; so was the pasture. The hay was made almost wholly from the spring crop. The first killing frost appeared about October first. Undeniably pastures and hay were lacking in quantity and of poor quality. These conditions were followed by an extremely high incidence of acetonemia in late winter and early spring. The year 1944 was exceptionally good for both pasture and hay; both early and late pastures being of good quality and plentiful. The first killing frost occurred after the fifteenth of December and the acetonemia season, beginning six to eight weeks later than in the preceding year, was of an unusually mild type and of low incidence. However, in an investigation of many cases that did occur the same pattern was found — poor roughage and inadequate pasture (in these cases due to bad farm practices).

During the summer of 1944 we made a trip over a considerable portion of the territory covered in these studies and we were able at that time to predict, not only that there would be much less acetonemia than usual in the section the following winter but to point out, with a high percentage of accuracy, as subsequent events showed, the herds in which acetonemia would occur. This relationship between feed and acetonemia is stressed repeatedly because there is no need for the acetonemia belt to suffer from its most costly disease of dairy cattle. The ailment can be prevented by good feeding practices.

On the summer trip (1944) previously referred to, the opportunity was embraced to discuss, with veterinarians consulted the preceding winter and with the owners, cows which were treated with vitamin A, i.e., cases of acetonemia. Uniformly, the report was that the cows had increased in their milk production until they were outstanding individuals in the herd. Several owners reported that they noticed a decided improvement in the physical appearance of the animals that were treated, saying in substance: "The animals slicked off better; they picked up in flesh and were in better condition than the untreated animals when they were turned out to pasture."

We treated a considerable number of animals that appeared to be just subsisting; they were neither growing nor producing. I considered them to be subclinical or marginal cases of vitamin A deficiency. The administration of vitamin A was followed by a decided improvement in their appearance and condition. Among these were several bulls, most of them in poor physical condition and more or

less impotent. Their history was that they had been stabled or penned, inadequately fed and underexercised. In all instances the impotency, whatever its degree, was replaced by normal libido when they were given vitamin A. The records are inadequate, but it is the opinion of the owners that these bulls subsequently settled the cows satisfactorily.

Sufficient data is not yet available to the writer for a general discussion of acetonemia, as it occurs in the northern states, but since statements have been widely disseminated that the type of this ailment seen in the northern states is not due to vitamin A deficiency,[12,13] a few cases observed in the writer's practice will be reported.

1. A famous sire owned by one of the foremost Aberdeen Angus breeders in the country: This bull had not settled a cow in several months and because of his great value, if a breeder, "had been the rounds" of the authorities. In getting his history it seemed to me he had had every vitamin treatment except the right one. To me the case was typical of subclinical acetonemia, in no material aspect different from many that I have seen in the acetonemia belt. I administered vitamin A and no other medicament. Recovery of full fertility was prompt and so far has been permanent.

This bull did not present the symptoms of acute clinical acetonemia. Even in the acetonemia belt, acute acetonemia is rare in bulls, if it occurs at all. That is not a mystery or a coincidence. When a bull reaches the point in vitamin A deficiency, where the recently parturient cow, at the top of her milk flow, would break down, the bull just quits doing anything —pays no attention to cows in heat, takes no exercise he is not forced to take, stops growing, if young, and in time his output of vitamin A becomes adjusted to his meager intake. Under these conditions physical deterioration sets in and progresses until he is disposed of as being useless or until he dies of some intercurrent ailment, to which he has become highly susceptible or, more often, continues a bare existence till "green up" and then recovers. Because of the inability of the cow in flush milk production to make this adjustment of output to intake of vitamin A she suffers a storm which, at its worst, we call acetonemia. The violence of the adjustment ranges all the way from acute acetonemia in the high producing cow to the slow change in the mature bull that is so moderate it is likely to be attributed to advancing age.

2. I was called to see two cows that had fallen off in milk production to two quarts daily. The calves of both cows had died within a few days from what was diagnosed, no doubt correctly, as scours. Both cows had suffered from retained placenta at calving. A history of the pasture and feeding practice and an examination of what the owner called hay made inevitable, the conclusion that these cows were suffering from vitamin A deficiency. They had everything but the nervous symptoms of acetonemia. They responded promptly to vitamin A therapy.

3. I was called to test a herd of cattle for brucellosis. Upon arrival I was almost startled by the close resemblance of these animals to herds I had seen again and again in the acetonemia belt. It was enough to make me wonder if I was away on another acetonemia survey and was in Tennessee, Georgia or Oklahoma, and not near home in Michigan. The owner was sure they had "Bangs" because they looked so bad and produced so little. The young stock were not growing; seven lactating cows produced a total of seven quarts of milk night and morning. The coats of all animals were rough and unkempt. A good feeder could not regard the physical condition as other than deplorable. The history, the feed, the production and the appearance of the animals could leave no doubt that the trouble was vitamin A deficiency. But they didn't have acetonemia. Why should they? They weren't doing anything. They had achieved a state of equilibrium where the meager intake of vitamin A equalled the skimpy output. Of course the obvious was —advise the owner to give his animals something to eat, that is suitable for a cow. However, I decided to try an experiment. No change was made in the inadequate ration of poor quality feed, but 500,000 units of vitamin A was given to each animal daily for seven days. Two weeks later all the animals had noticeably improved in physical condition and the cows had increased considerably in milk production. Then the owner was told what to do about feeding them. It didn't suit him at all. He wanted more medicine!

I have had no typical case of acetomia in my own practice, since I determined the condition to be due to vitamin A deficiency, but from the foregoing experience in Michigan where tall grass is as characteristic as tall corn in Iowa (only we say less about it) and from discussing the matter with many veterinarians who practice in northern states, I entertain no doubt that vitamin A deficiency occurs in all sections where there are cattle. Some farms and some farmers are like that. If a cow puts out more vitamin A than she takes in over a prolonged period she will suffer from acetonemia, regardless of where she is located.

Sulfonamide Drugs in the Treatment of Ulcerative Enteritis of Quail

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SULFONAMIDE drugs developed for the specific treatment of intestinal diseases of mammals have proved valuable in veterinary as well as human medicine. Infectious scours in calves has been treated successfully by use of sulfaguanidine,[1,2] sulfasuxidine[3,4] and sulfathalidine.[4] Sulfaguanidine has also been effective in reducing the mortality rate among swine suffering from infectious enteritis.[5,6,7] Enteric infections of both dogs and cats have been cured by the use of sulfaguanidine[8] and sulfasuxidine.[9] These successes prompted a study of such compounds as agents for controlling outbreaks of "quail disease" or ulcerative enteritis of quail, grouse, partridges and wild turkeys.

As ulcerative enteritis is the most serious disease to which propagated quail are subject, it has earned the title of "quail disease." Game farmers are well aware of its infectious nature and of its high mortality. When an outbreak occurs, the owner can segregate sick birds, separate the remainder into small groups to reduce contacts, clean up the premises, and then hope that the mortality will not be 100% in spite of his efforts. Any treatment which could stop an epizootic would be heartily welcomed by the game manager. The experiments reported here were undertaken in the hope that the sulfa drugs developed for combatting intestinal infections of mammals would be of value in quail disease also.

Any possible treatment for this disease must meet several requirements. In the first place, its action must be rapid. Although many birds develop a chronic type of infection, the acute form kills within a few days. In a natural outbreak it is impossible to know exactly when each bird becomes infected so that the exact duration of the disease is uncertain. However, birds fed infective material may die within two days. In the second place, the treatment must be relatively cheap. The financial value of quail is so low that methods which would be feasible for valuable cats or dogs, not to mention larger animals, are impractical for these birds. Lastly, the method of administering the drug must permit of self-medication by the birds. Individual feeding of measured doses four or six times daily would insure rapid attainment of a high drug concentration in the intestine and more even maintenance of that level. But this method, which would be satisfactory for laboratory experiments involving only a few birds, could not be applied generally. In these experiments the drug was mixed with the regular mash and the birds allowed to feed at will, since this is the only method which could be recommended for general use.

The drugs tested included the three already mentioned: Sulfaguanidine (sulfanilyl guanidine monohydrate), sulfathalidine (phthalylsulfathiazole), and sulfasuxidine (succinylsulfathiazole). Trial feeding tests with normal bobwhite quail have shown that these drugs are well tolerated.

Materials and Methods

Normal, pen-raised bobwhite quail were used. Birds in Groups VI to IX were approximately six months old. Those used in the first five groups were all at least one year old.

The medicated mash was made by incorporating 2.0% by weight of the drug in the standard maintenance mash. The amount of food eaten was not determined, but observations indicated that intake was normal. The medicated mash and water were provided *ad lib.* at all times.

Quail were either fed infective material or exposed to diseased birds and their droppings. The infective material consisted of finely ground intestines (including contents) of bobwhite quail which had died of ulcerative enteritis. This material was diluted with nutrient broth, and a portion of the mixture introduced into the crop by means of a feeding pipette.

Birds in the first five groups were fed massive doses consisting of approximately 1cc of ground intestinal suspension. A single lot of material, pooled from two birds, was used to infect those in the first four groups. Material fed to Group V proved very virulent. It was composed of intestines from birds of Group I (control) and also some stored material obtained during an epizootic six months previously. Birds in Group II were provided with medicated mash, immediately following the infective dose, while Groups III and IV were permitted to feed on the medicated mash for two hours before administration of the infective material. The birds were housed in the

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usual indoor cages with wire bottoms, with medicated mash only and water available at all times.

The second series of experiments was planned to study the value of the drugs under conditions more nearly simulating a natural outbreak. For these trials a large outdoor holding pen was divided into three sections by wire partitions running the length of the cage so that three tests could be run simultaneously. While the experiment proceeded, no effort was made to provide the usual sanitary conditions. Watering pans and feeders were refilled without cleaning and all droppings were allowed to accumulate. Building paper was used to cover the bottom of the pens so that the droppings would be retained and increase the possibilities of infection.

Twelve young, previously unexposed, quail were put into each of the three compartments. The disease was started by introducing other birds which had been dosed with infective intestinal material. The exposure in all cages was made as nearly equal as possible by introducing a new set of three dosed birds as soon as the first of the previous group died. Each lot of infected birds was dosed from the same material. The short survival periods of the dosed birds prove the virulence of the inoculum. In all, four sets of dosed birds were put with each lot of twelve contact cases. The first three of these died on the second day. Two of the second lot died on the second day, the last one on the third day. One of the third group of the dosed birds survived until the eighth day though two died on the third day. In the last group one bird was dead on the fourth day and the others on the following day.

Birds in the center compartment (Group VI) were kept as controls and fed on the regular non-medicated mash. A second group (VII) was given mash containing 2.0% sulfaguanidine, and the third (VIII) received 2.0% sulfathalidine. All quail except the control group were allowed to feed on the medicated mash for three days before the introduction of diseased birds.

Group IX was not started until all birds on the previous tests had died. This group was held in a clean indoor pen and fed on 2.0% sulfathalidine mash mix for three days. They were then placed in one of the contaminated outdoor holding pen compartments and continued on medicated mash. Infection occurred from pen contamination only; no dosed birds were put with this group.

All birds were examined post mortem and determination of the cause of death made by the finding of typical intestinal lesions.

Results

The three drugs used were entirely ineffective in preventing development of ulcerative enteritis. Eighteen of the nineteen birds fed quail disease material died of the infection within 12 days. Table I, which shows the number of birds dying each day, reveals the fact that the medication did not even prolong the course of the disease.

The survival of one bird cannot positively be credited to treatment as mortality is not always 100% among untreated quail. This survivor (Group IV) proved to be only temporarily immune. It was continued on the 2.0% sulfasuxidine mash for three weeks and then changed to regular mash. Four and a half weeks later it proved susceptible, dying two days after a feeding of infective intestinal material.

All of the 36 quail exposed to diseased birds and their droppings, and all 12 exposed to pen contamination only, died of the infection with the production of typical intestinal ulceration. Although the birds fed sulfaguanidine or sulfathalidine had a slightly longer average survival time than did the control birds, all were dead within 17 days. Table II, showing the number of the birds dying each day of the test, clearly indicates that the advantage of treated over untreated birds was slight as to survival time. Of course, it is impossible to state just when any given bird acquired a fatal infective dose of bacteria so "number of days before death" means total time in the experimental pen after introduction of the

TABLE I.—SURVIVAL OF QUAIL EXPOSED TO ULCERATIVE ENTERITIS BY DOSING

Group Number	Medication	Method	Days before death												Total number	
			1	2	3	4	5	6	7	8	9	10	11	12	Dying	Surviving
I	None (control)	—				1			2			1			4	0
II	2.0% sulfaguanidine	A						1	1	1		1			4	0
III	2.0% sulfaguanidine	B					1					2		1	4	0
IV	2.0% sulfasuxidine	B		1						1			1		3	1
V	2.0% sulfathalidine	C			1	1	1								3	0
Total number dead			0	1	1	2	2	1	3	2	0	4	1	1	18	

A—Birds were put on medicated mash immediately after infective dose.
B—Birds were given medicated mash for 2 hours before infective dose.
C—Special mash was available before the test feeding but apparently none was eaten until the following morning.

first infected bird. Data for birds fed sulfasuxidine are tabulated with those for the other groups for convenience. It should be remembered that these birds were infected from contaminated surroundings only.

Discussion

The amount of mash consumed was not determined, but the birds apparently ate normally. The crops of most of them were full when examined at autopsy. Previous tests with normal adult quail fed medicated mash had shown a daily range in food consumption within the normal limits of 9.0 to 13.0 grams per bird for those housed in the indoor cages. When a 2.0% mix is fed, this represents a daily intake of 0.18 to 0.26 grams of drug per bird. For a bird weighing 150.0 grams (average weight of birds used) this would represent a rate of 1.2 to 1.7 grams per kilogram body weight, an amount which should be adequate if the drug is capable of bacteriostatic action against the causal organism.

TABLE II.—SURVIVAL OF QUAIL EXPOSED TO ULCERATIVE ENTERITIS BY CONTACT

Group Number	Medication	Days before death																	Total number	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Dying	Surviving
VI	None (control)							1	2	3	2	1	2			1			12	0
VII	2.0% sulfaguanidine						1		3	1			1	1		3	1	1	12	0
VIII	2.0% sulfathalidine				1				1	3	1	3		1		2			12	0
IX	2.0% sulfasuxidine			3		3	1		3	1		1							12	0
Total number dead		0	0	3	1	3	2	1	9	8	3	5	3	2	0	6	1	1	48	0

Summary and Conclusions

1. Eighteen of nineteen bobwhite quail given a single feeding of intestinal material from birds which had died of ulcerative enteritis also died of this disease. Four of this number received regular mash, eight had a mixture containing 2.0% sulfaguanidine, three had a mash containing 2.0% sulfathalidine and for the other three the mash contained 2.0% sulfasuxidine.

2. Immunity of the one bird which survived the feeding was only temporary. Less than two months later it died of quail disease, two days after again being fed infectious material.

3. All 36 quail exposed to infected birds and their droppings died of ulcerative enteritis. Birds fed mash containing 2.0% sulfaguanidine or 2.0% sulfathalidine died almost as soon as those in the control group.

4. The mortality for a group of 12 birds fed mash containing 2.0% sulfasuxidine during their exposure in a contaminated pen was 100%.

5. As these three drugs are valueless for the prevention of treatment of quail disease, immediate segregation of sick birds and strict attention to sanitation remain the only methods known for controlling outbreaks of ulcerative enteritis.

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Birds in America are suspected of being carriers of tularemia and probably Rocky Mountain spotted fever, since many are found to harbor the nymphs and larvae of the common rabbit tick which is believed to be a spreader of tularemia among rabbits, and the disease may spread naturally to other species of ticks some of which are incriminated as vectors of Rocky Mountain spotted fever. One brown thrasher has been known to harbor 495 young rabbit ticks and from 24 of these common birds 2,111 ticks have been removed.

★ ★ ★ ★

★ ★ ★ BUY WAR BONDS ★ ★ ★
AND HOLD THEM

Mineral Deficiencies in Animals

So much attention is being given to vitamin deficiencies in animals and real, possible and even purely imaginary vitamin deficiencies in the human family that a very real deficiency of certain mineral elements in the ration of various domestic animals is not receiving the attention from research workers that its economic importance deserves.

There are both similarities and dissimilarities in vitamin and mineral deficiencies. As with vitamins the bulk of some minerals required by the animal organism is almost infinitesimal. As with vitamins the effect of the lack of these minute amounts is sometimes spectacular and, as with vitamins the subclinical or marginal deficiencies are more important, economically, than the frank deficiencies, i.e., marginal and usually unrecognized deficiencies are far more numerous than the more severe.

In contrast to vitamin deficiencies, mineral deficiencies, except for calcium deficiency, are as common in animals on pasture as in those stall-fed or pen-fed. And they are regional. Areas exist in many lands in which cobalt, copper, iodine, magnesium or phosphorus deficiencies occur because these elements are deficient in the soil in such areas or, if present, are in forms not available to animals that consume forage grown upon such areas. In addition, calcium deficiencies occur because the requirement of the animal is greater than its capacity to assimilate the mineral or because of a vitamin D deficiency its capacity to utilize calcium is impaired. The foregoing refer to deficiencies of cattle, sheep and the solipeds. There is little definite information available on mineral deficiencies of swine, and poultry have a group of mineral deficiencies all their own.

The known areas in the United States in which animals suffer from mineral deficiencies to a clinical degree are, except for calcium deficiency, quite limited. Unfortunately such areas may not all be known. Sometimes nutritional deficiencies are obscured by other conditions such as parasitism. Anything that interferes with the nutrition of animals increases their susceptibility to parasites, which may quickly become more important than the original ailment and obscure it.

Cobalt Deficiency.—This is probably the most widespread of the "trace element" (cobalt, copper, iodine, manganese) deficiencies but in the United States, so far as is known it (Grand Traverse disease) occurs only in the Upper Peninsula of Michigan and, perhaps, in Massachusetts. A combined cobalt and copper deficiency, salt sickness, occurs in Florida.

Clinically, cobalt deficiency in no way differs from slow starvation. Affected animals, even on luxuriant pastures, progress to the extremes of emaciation and die of inanition if they are not given cobalt or changed to "healthy" pastures. Affected animals, if given cobalt chloride, recover spectacularly. This is the basis of clinical diagnosis. Cobalt deficiency appears to be exclusively a disease of cattle and sheep. Horses do well on pastures that will not support life in cattle or sheep.

It has been known for only about a decade that cobalt is essential to animal life and the discovery that diseases, known throughout the world by more than a dozen different names are cobalt deficiencies, is even more recent, yet for 75 years and more, veterinary literature has contained discussions of what is now recognized as cobalt deficiency.

Copper Deficiency.—A deficiency of this metal is responsible for disease in cattle and sheep on many pasture areas in Australia, the Netherlands and the British Isles. Copper deficiency alone may not occur in the United States, but the evidence is rather convincing that wobbles in colts may be such deficiency.

A combined copper and cobalt deficiency occurring in cattle on certain coastal ranges in Florida has already been mentioned. The symptoms are those of cobalt deficiency—starvation.

Nutritional anemia of young pigs occurs pretty much throughout the section of the United States in which the winters are cold. It is a copper and iron deficiency, due not to a deficiency of either metal in the rations of swine but to faulty swine husbandry practices. The condition, nor its cure nor prevention needs any description.

Iodine Deficiency.—More areas in which iodine deficiency occurs in the domestic animals have been delineated in the United States than in all the remainder of the earth's surface. Extreme iodine deficiency characterized by rough coats, unthriftiness, impaired reproduction and the birth of young that are hairless, goiterous and weak or dead, have been reported from North Dakota, Iowa, Michigan, Montana, Idaho, Washington and Oregon. Cattle, sheep, swine and horses all are affected.

Over a considerably wider area the addition of iodine to the ration of farm animals is believed to result in improved performance, more rapid growth and increased reproduction.

The requirement of animals for an iodine supplement of the ration, even in the most deficient areas is small and easily supplied by furnishing them with iodized common salt or by adding a small quantity of sodium iodide to the feed at weekly intervals.

Magnesium Deficiency.—A nervous condition, grass or lactation tetany, occurs in cows and to a less extent in mares in the United States, Holland, Norway, Britain, New Zealand and, perhaps, elsewhere. It is associated with hypomagnesia. The condition usually occurs soon after calving in cows, that are on lush pasture, but it sometimes occurs also in non-lactating animals and in those that are stall-fed. A condition, indistinguishable clinically, occurs in cattle after rail shipments.

Not much is known of the cause of the disease. It does not seem regularly associated with a deficiency of magnesium in the ration, but it responds to magnesium therapy. There is some evidence that it is an endocrine dysfunction.

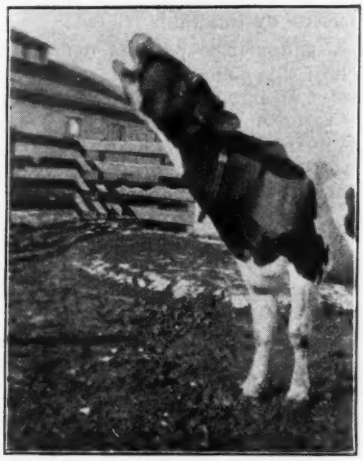
Chlorine Deficiency.—Herbivorous animals and swine that are deprived of sodium chloride as a part of their ration for periods of three weeks or longer, suffer an impaired appetite and ultimately a depraved appetite and death. The condition has been termed a sodium deficiency and a sodium-potassium imbalance. However, the condition can be prevented by feeding either potassium or ammonium chloride and on that evidence would appear to be a chlorine deficiency.

The need for sodium chloride in addition to that available in forage is thought by some to be a product of domestication, i.e., due to the rapid growth, greater milk and wool production and, in horses, hard work and consequent excessive perspiration. Nevertheless "salt licks" where native herbivores ate earth occur pretty much all over the country. Whether they ate the earth to obtain sodium chloride is not known but is probable.

Adequate sodium chloride is indispensable to optimum thrift in animals. The amount required varies widely. For example, horses at moderate work in ordinary weather are satisfied with three-quarters of an ounce of salt daily; at hard work in very hot weather they will greedily consume three ounces daily. The efficiency of swine in converting feed into gains in weight is lowered if they are deprived of even a small portion of the optimum ration of salt. Since the requirement for sodium chloride varies, from time to time, depending upon the ration, the amount of exercise, the milk production, etc., the only dependable rule for supplying salt is to allow the animals free access to it; enabling them to consume all they want.

Phosphorus Deficiency.—Acute phosphorus deficiency occurs in cattle in North Dakota, Wisconsin, Texas and Florida. It is quite often complicated by botulism, contracted from eating bones with particles of carrion attached. There are many farms and larger areas where cattle are observed to eat bones from which clinical aphosphorosis or hypophosphorosis has not been reported. When cattle eat bones hypophosphorosis should be suspected.

Phosphorus is an element of which many soils are depleted by cropping. Hypophosphorosis, therefore, may be expected to increase in prevalence as the land is depleted



Bone chewing—osteopagia, a specific form of pica. In milder forms only the best sun-bleached bones are eaten; in aggravated forms all bones, even putrid bones from rotting carcasses, are eaten. In extreme cases osteophagia may develop into allotriophagia when any sort of rubbish will be chewed.

by cropping. Plants contain less phosphorus in dry seasons than in normal seasons and thus phosphorus deficiency in animals is more apt to occur during or following droughts than at other times.

Calcium Deficiency.—Calcium is the most plentiful of the minerals essential to animal life. Animals obtain it chiefly from the forage they consume. Calcium deficiency probably does not occur in any animals on pasture. When it occurs in stall or pen-fed animals it is more often because of the unavailability of calcium than because of a deficiency of it in the feed.

Thus, in sections of the country where calves and foals are closely housed, all winter they commonly suffer from rickets, due to lack of

vitamin D. Swine are similarly affected. In the cities many puppies are born in the basements of buildings from which they do not emerge for weeks. They suffer from rickets, not from lack of calcium in the ration, but from lack of vitamin D to assist in its assimilation.

Heavy producing milk cows, that are at the same time providing for the development of a fetus, may have a need for calcium in excess of their capacity to assimilate it and thus suffer a depletion of this element.

While parturient paresis is characterized by a deficiency of calcium in the blood it is by no means certain that there is a paucity of calcium in the whole body. Rather, the condition is a metabolic disturbance due, perhaps, to endocrine dysfunction.

Horses suffer from calcium deficiency; (1) for lack of this element in the ration and (2) because of an imbalance of the calcium-phosphorus ratio. As early as 1850 veterinary literature in this country stated with great positiveness that a ration of corn and leached corn fodder was a frequent cause of osteoporosis in horses. Later, corn and late cut timothy hay were recognized as causes of osteoporosis. Both rations are about as low in calcium as anything a horse can be induced to eat.

For many years an intermittent lameness in horses, that shifted about from leg to leg, has been recognized. As the disease progresses, vegetative growth occur on the surfaces of joints and depressions develop in these surfaces. Later, the skeleton becomes rarefied and the bones brittle and easily broken. There is some thickening of the bones of the face but not so pronounced as in osteoporosis. There is an excessive deposit of fat in the bone-marrow and the nerve trunks seem to lose their connective tissue and are easily spread between the thumb and finger. In France it was formerly called bran disease; in this country millet disease and by others shifting lameness, Holt and Kintner termed it osteomalacia and Sir Arnold Theiler designated it osteodystrophia. It is due, not to the animals getting too little calcium, but to a disproportionate amount of phosphorus in the ration.

Where horses subsist on a forage low in calcium such as corn stover, wheat-straw, timothy hay that is mostly stems, or late cut, inferior quality prairie hay and, at the same time, receive a grain ration rich in phosphorus, such as one including bran or linseed meal, they are prone to develop this disease. It is estimated that the optimum calcium-phosphorus ratio in the ration for a horse is 2:1 or higher. Horses will tolerate a ratio as low as 1:1, but if the amount of phosphorus exceeds the calcium, trouble follows.

Horses that have developed the disease in

Army mule suffering from osteomalacia due to a low calcium-high phosphorus diet. The photographs were taken one minute apart and show the frequent change of the weight bearing leg, an early symptom of the disease.—*Photo by Greenlee*

the early stages can be restored to usefulness by a high calcium-low phosphorus ration. Inorganic calcium, powdered limestone, is less effective than calcium from organic sources.

Alfalfa hay is the source of choice.

Swine with no pasturage and fed almost exclusively on grain with no milk products or mineral supplements, suffer from calcium deficiency.

It should not be overlooked that when an animal is suffering from a deficiency that impairs its appetite, as for example cobalt deficiency, in time it will suffer from other deficiencies also and calcium, because it is required in large amounts, is one of the early secondary deficiencies which is likely to develop.

Manganese Deficiency.—There is little available information on manganese deficiency in farm animals other than poultry. When artificially induced in calves it is reported to impair their fecundity later. Whether a naturally occurring manganese deficiency is responsible for some of the breeding difficulties experienced in cattle has not been determined. Some research scientists suspect that it may be responsible for some "shy" breeding.

Reminiscences VII

By NELSON S. MAYO
Highland Park, Illinois

IN SPANISH times, infant mortality from tetanus due to umbilical infection was high, but the U. S. Army Medical Department trained midwives until this loss was practically non-existent. The army also required all children to wear shoes to prevent foot injuries, although shoes were the only objects worn except a Catholic emblem. In Havana, an order was issued that all children must wear shirts, but the mothers usually tied them up between the shoulder blades to keep them clean.

Once, in riding through the country, I passed a small farm where there was a mule suffering from colic. The farmer had some turpentine, so I drenched the mule. When passing the place on my return, I stopped to ask about the mule. They said that soon after I left they got a little twin girl to come and make the sign of the cross over the mule and it got well at once!

At our station, the natives of the town got to bringing their horses to our carriage house to wash them with a hose. It soon became a nuisance and I put up a "stop" sign. Soon afterward I found that a local man was having one of our workmen wash his horse. I sent him away "pronto". In a short time, a boy brought a note from the owner to the effect that if I did not apologize at once he would have General A. call on me to demand satisfaction. In the boy's presence, I tore up the note and threw it into the wastebasket. I've always regretted that I did not keep it as a souvenir of a duel that did not happen.

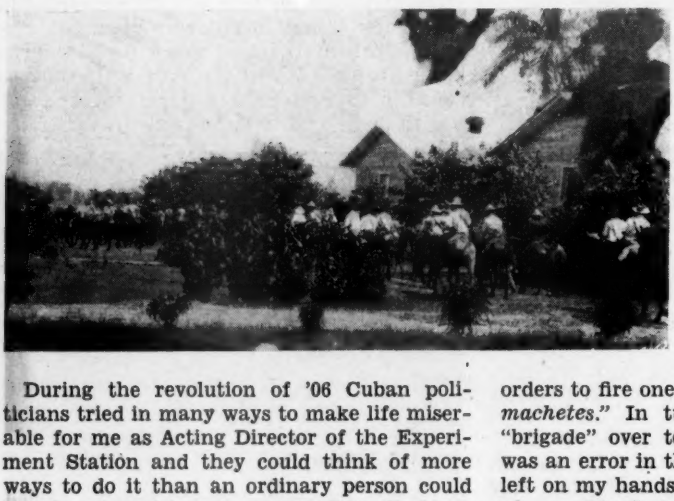
Milk was supplied to small towns by men who put the milk into wine or beer bottles and brought it in on a horse, in saddle bags made out of gunny sacks. There were plenty of sanitary regulations covering the sale of milk, but they were seldom enforced. One day a policeman from the town brought a milkman and a bottle of pink milk to our station for examination, as the policeman did not think that the milk was pure. When it was allowed to stand, the *cream settled to the bottom* and it proved to be sweet potato starch (boniato). The pink color was due to a dirty wine bottle, and water had been added. The milkman was taken before the police judge and fined. A number of milkmen were awaiting the results and one said to the others, "You can't put any more *boniato* into your milk but you can put in water, just as always".

One day at noon, a message came from President Palma to have some purebred pigs, chickens and a Hereford bull at a railway station some three miles away, for shipment to his ranch that afternoon. It was very short notice, but we got them started. I rode over on my horse to see that everything was all right. The men with the load of crated animals drove up and I asked the Chief of the station, who was strutting in uniform, where he wanted them unloaded. He shrugged his shoulders and did not answer, so the men were told to unload on the platform. Later, he told my men to move the crates clear to the other end of the platform. I told my men not to touch them. If the Chief wanted them there, he could move them himself. He was displeased and made a few rather pointed remarks; but when he found that these animals belonged to the President, he beckoned me to come, but I sat on my horse, folded my arms, and stuck my nose at a 45° angle. I told him a few things in not very plain but vigorous Spanish that he understood, and he begged me not to tell the President. Officials consider themselves very important and one has to be a "higher up" to get by.

A travelling dairy in Cuba

Our five-year stay in Cuba can be divided into two periods: the first two-and-one-half years under the administration of President Palma and the remainder during the revolution and the second American intervention. In 1906 there was a revolution and President Theodore Roosevelt sent an American army to Cuba to put it down, bring order out of chaos and give protection to life and property. President Palma had taken an active part in the revolution of '68 to '78. He was captured by the Spaniards and sent a prisoner to Spain. Later he was released, came to the United States and became an American citizen. During the Cuban revolution of '95 to '98 he was head of the Cuban Junta in New York that

supplied arms to the Cuban forces. At the close of the Spanish-American war he renounced his American citizenship and returned to Cuba. He landed at a small port in eastern Cuba where he had left as a Spanish prisoner 25 years earlier. He made a triumphal journey through the island, and was elected the first president of the Republic of Cuba. He gave Cuba an honest, efficient administration. In 1906 he was reelected but the opposition political party "took to the hills" and started a revolution that resulted in American intervention. President Palma resigned and moved to a ranch that he owned in eastern Cuba. There he conducted a school for adult Cubans, teaching them to read and write. He soon died, his friends said, "of a broken heart." Years later the Cuban Government erected a beautiful marble monument in Havana to the memory of this great Patriot. President Palma was a true friend of mine and I admired him greatly.



Rebels entering the grounds of the Cuban Experiment Station

During the revolution of '06 Cuban politicians tried in many ways to make life miserable for me as Acting Director of the Experiment Station and they could think of more ways to do it than an ordinary person could imagine. I used to get so angry I hardly knew what to do, and then I would sit down and laugh. After the American Army took things over some of these same politicians solicited my aid in securing favors from the American authorities.

The Cuban revolutionists formed small bands in remote parts of the island, stole horses and lived off the country. When one band of rebels encountered another they "swapped" horses so they would not take the same animals back to the locality where they were stolen. Our experiment station was a favorable camping place for the rebels and different bands were camped there for several weeks. We tried to meet the commanding "General" and offer what favors we could, like stables, pastures, etc. I knew they would take them anyway but preferred to be generous. We asked that the men be kept from the private grounds. The rebels respected our request and there were no difficulties although the whole situation was tense.

The officers were taken through the laboratories. On one occasion they noticed an incubator of hatching chickens and they asked the privilege of allowing the men to see this. None of them had ever before seen an incubator and they were truly amazed.

When the American Army took over the situation, I was authorized to receive the Arms of a "brigade" of rebels encamped in our station. They turned in 101 rifles, mostly old single shot Remington carbines, all having had the barrels cut down. Not one rifle in the lot had both sights on. I asked the general what he would do if his "brigade" encountered some modern troops. His answer was "I have given orders to fire one shot and go after them with *machetes*." In turning the arms from this "brigade" over to the American Army there was an error in the count and I had two rifles left on my hands. They now decorate the wall of my "den" together with the campaign *machete* that the General gave me as a memento of the occasion. He also gave me a letter of thanks for the courtesies extended to his officers and men. After the revolution was over the Acting Secretary of Agriculture also sent me a letter of thanks for the manner in which the experiment station had been cared for.

I met the parish priest on the street and he told me he had been preaching against the rebels and he had been threatened with personal violence. I invited him to stay with me which he did. He said a masonic friend had told him I would probably help him.

(To be continued)

Advantages of Artificial Insemination of Animals

The advantages and limitations of artificial insemination as a method of livestock breeding have been discussed by many writers in recent years. There is little doubt that the method holds considerable promise for animal improvement. Waddington (1942) considered it the most important new biological technique at present passing into general practice. Technical progress has made its application a practical proposition; the following are some of its advantages in comparison with natural mating.

1. *Increased use of sires.*—Artificial insemination provides a means of impregnating large numbers of females with sperm from one male, whose influence can thus be greatly extended. It allows the greatest possible advancement in dairy cattle breeding by making sires "proved" for milk and butterfat production available to a large group of herds, even distant herds, by the use of rail and air transport of semen. The best genetic stocks of cattle and sheep may be spread widely throughout the world at very small expense compared with the present system of conveying breeding animals by sea and rail.

2. *Evaluation of young sires.*—The reproductive life of sires is comparatively short; one of the practical problems in animal breeding is to prove sires early enough in life so that the information may be used to discard the poor sires before they have done too much harm and to recognize and use the best sires as soon as possible. With artificial insemination young bulls might be proved at an earlier age than with natural mating; progeny tests on bulls can be done on a more adequate scale and environmental influences offset to a certain extent by the use of such bulls on cows on different farms.

3. *Extending period of use of valuable sires.*—Because of age or crippled condition a male may be unable to serve properly or he may only be able to serve a limited number of females. By the use of artificial insemination the period of usefulness of such sires may be extended.

4. *Difficulties due to difference in size, etc.,* may be overcome, such as the use of heavy bulls on yearling heifers. Crippled cows that cannot be bred naturally may be bred artificially (Clapp).

5. *Maintenance of satisfactory fertility.*—Artificial insemination can be expected only to give, at the best, results comparable with those from natural mating. However, certain parts of the procedure assist in obtaining and maintaining a satisfactory conception rate. These include (*a*) regular microscopic examination of the semen and the use only of high quality semen for insemination; (*b*) keeping of good records and close attention to breeding performance; (*c*) examination of cows for pregnancy; (*d*) early detection of cases of sterility and their treatment. In the mare the percentage of conceptions might be increased by repeated insemination during heat. Insemination might be used to achieve this when service by the stallion is not available.

6. *Increased use of sires in monogamous species.*—In monogamous species artificial insemination offers a means of increasing use of valuable sires.

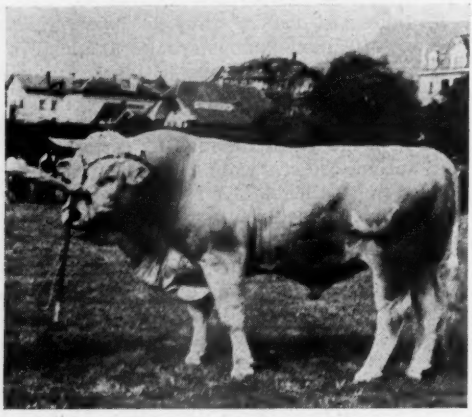
7. *In hybridization.*—The method has been used in a few cases for making certain racial and species crosses, when natural mating has proved impracticable due to differences in size, anatomical structure or psychological characteristics.

8. *Aid in disease control.*—Artificial insemination provides a means of preventing exposure of sires to genital disease and thus indirectly of minimizing the spread of disease. The indiscriminate use of bulls among several herds encourages the spread of genital disease and sterility. In herds of cows there are several important diseases which lend themselves to some measure of control by artificial insemination—brucellosis, trichomoniasis, contagious vaginitis, coital exanthema, while infection with genital tuberculosis and possibly with *Corynebacterium pyogenes* and other organisms might be added. In a herd infected with genital disease it is possible, after the bull has been cured or replaced by a fertile, disease-free bull, to continue to fertilize females and to maintain or improve the birth rate without risk of spreading infection to healthy animals.

9. *Benefits to small herds.*—Smith (1939) held that the greatest immediate value of artificial insemination lies with its use in commercial herds, and particularly in small herds, where a distinct saving may be effected. The owner of a small herd cannot afford to keep a bull for only a few cows and, if he does, he probably cannot afford to pay a large price for a bull. Part of the large sums of public funds already spent on bull premium schemes might well be diverted to artificial insemination, and the quality of commercial cattle improved.

Similarly, Fowler (1942) and Hammond (1942) have stressed the limit to the breeding program of the small farmer imposed by his funds and the advantages which would accrue from artificial insemination in allowing him the use of well-bred sires at little cost. Hammond considers it of essential importance in

dairy cattle, for the true genetic worth of a dairy bull is not known until his daughters come into milk, when he is at least five years old. Under present conditions the use of a bull of proved value is limited to one herd, or a small group of herds, where he will produce only about 30 or 40 calves a year. But with the aid of artificial insemination his progeny can be widely spread over the country, and by producing a thousand or more calves a year, thus in practice he may quickly and materially increase the efficiency of the dairy industry of the whole community in which he is utilized.



Artificial insemination makes it possible to prove sires at an earlier age than with natural mating

A relatively large number of bulls are in use in small herds; many are grade animals and even the purebred bulls are frequently of indifferent merit. The quality of the next generation is given little thought, yet more than half of the cattle bred come from herds of this size. Edwards pointed out that the cost of procuring a few first-class sires and of organizing an artificial breeding scheme would be small compared with that of keeping the bulls required under the present system.

10. *General.*—It eliminates the need for taking females to the sire and *vice versa*. There is no need to keep a sire. Many animals can be artificially inseminated on the same day without the strain on the sire that natural service would entail. For cattle, the charge is no higher than yearly bull service cost per bull on most dairy farms. This practice will allow the mass of breeders to take advantage of the benefits at present available to the few.

Participation in a better breeding program and study of mutual breeding problems brings forth the best thought and community spirit for advancement of the breeding business (Perry and Bartlett).—From "The Semen of Animals and Its Use for Artificial Insemination."

A bill authorizing the president of the Oklahoma state board of agriculture to appoint inspectors for meat slaughtered for human consumption was killed in the lower house of the state legislature on April 19. The measure was fought as a "political bill" for the benefit of the state board president.—*Nat'l Provisioner.*

* * * *

Speaking at the 49th annual conference of the Association of Food and Drug Officials, Commissioner C. Chester DuMond of the New York State Department of Agriculture said:

"I believe the slaughterers of our meat animils will be required to have an ante-mortem and a post-mortem inspection by a veterinarian of all animals for certification of freedom from disease."

* * * *

Secretary Anderson Outlines New Slaughter Certification Program

The Patman amendment to the Stabilization Act of 1942 provides that no quota or other slaughtering limitation shall be imposed on any plant if the Secretary of Agriculture has certified that the slaughtering plant is operated under sanitary conditions, and the meat produced therein is clean, wholesome, and suitable for human consumption.

The applicant will be required to show that (1) OPA price, rationing, and other regulations are being and have been observed; (2) the meat will move in legitimate trade channels within legal price ceilings; (3) the plant meets sanitary standards which will be prescribed in the regulations; (4) meat production will be conducted under the supervision of qualified veterinary inspectors providing both ante-mortem and post-mortem inspection; and (5) the plant will participate in providing such meat for governmental agencies as may be required.

In connection with the requirements for certification, the Secretary pointed out that the law placed upon the Department the responsibility for certifying that the meat produced is clean, wholesome, and suitable for human consumption. For this reason it will be necessary to require that adequate supervision be provided. The Secretary said that local or state inspection would be recognized provided it is conducted in a manner that will satisfy him that these conditions were being met. In this respect, he said that local authorities will have to assume some responsibility but that the Department of Agriculture will make periodic examinations of the plants operating under the provisions of the certification to see that sanitary standards are maintained and that meat is properly handled.

Clinical Reports

Coliform Nephritis in a Dog

April 22, 1945, a male German shepherd about four years old and with a history of anorexia and depression and a temperature of 106° F. was presented for treatment. He was given 1500 Oxford units of penicillin intramuscularly immediately.

A blood sample, taken the next day, was negative for Leptospira. At this time the temperature had dropped to 100.6° F. and it remained at that point or slightly lower for three days. During this time he ate sporadically and was somewhat depressed. He urinated normally and the feces appeared normal.

On the fifth day the temperature was 103.1° F. and 100,000 Oxford units of penicillin was administered intramuscularly, and four multiple vitamin capsules were given orally.

On the sixth day the temperature was 104.4° F. and he was given a sodium bicarbonate enema. His feces appeared normal at this time.

On the seventh day the animal was much depressed and multiple necrotic areas and icterus began to show on the mucous surfaces of the tongue. A transfusion of 275cc of citrated blood was administered intravenously and a dose of thiamine hydrochloride was injected subcutaneously.

The dog died that night and a post-mortem examination the next morning revealed the following: Small necrotic areas on the tongue, the esophagus appeared normal. A severe hemorrhagic gastroenteritis involving the entire mucous surface of the stomach and intestines was present. The serous surface of the peritoneal cavity was covered with bile. The serosa appeared reddened and inflammed.

The thoracic cavity appeared normal in all respects.

The spleen was normal in size but had two hemorrhagic infarcts two centimeters in diameter on its base.

The liver was dark red in color and swollen.

The gallbladder had a hole in it the size of a pin head, which accounted for the bile covered serosa of the pertitoneal cavity. It was empty and had no abscesses on it. The bile duct was open.

The prostate gland was normal in size and each lobe had an abscess in it about one centimeter in diameter. The bladder was not distended with urine.

The kidneys were covered with multiple abscesses with a raised surface one centimeter each in diameter. Cloudy degeneration was present in the kidneys. A pure culture of *Escherichia coli* was grown from the abscesses in the kidneys on blood agar plate cultures and in fermentation tube tests.

The difficulty of diagnosis in this case is apparent.

HAROLD M. HAINES

Manchester, Iowa

* * * *

Penicillin in Hemorrhagic Septicemia

This herd consisted of 24 cows of which 12 acquired hemorrhagic septicemia in the course of the outbreak. The temperatures rose to around 105° F. and the usual symptoms were present. Ten of the cows responded to the usual treatment for the disease.

It has been my experience in herds with this disease that there are usually one or two cows which do not respond to any treatment but die. In this herd there were two cases of this type. The first was a Holstein heifer that had freshened with her first calf about 10 days previously. Her temperature stayed around 104 to 105° F. for several days. Daily injections of 100 to 150cc of serum and the administration of three ounces of sulfanilamide or sulfapyridine failed to benefit her. The heifer continued to worsen and by the time the penicillin was started, anorexia had been complete for two days, her ears were drooped, breathing was rapid with extreme dyspnea, and rales were present over the lungs. Fifty thousand units of penicillin was given every four hours and, after 24 hours the temperature was normal, breathing was easier, her ears were up and she began to eat. Penicillin was continued for another 24 hours, even though the temperature remained normal. Improvement continued to complete recovery of the heifer.

The second case was similar to the foregoing. This was a Holstein heifer due to calve for the first time in about a week. An interesting observation in this case was that 50,000 units of penicillin every four hours was ineffective over a 48-hour period. However, when the dose was doubled to 100,000 units every four hours, the temperature dropped to normal in 24 hours, and the heifer began to eat. She also made a complete recovery.

I am anxious to learn what experiences other practitioners have had with penicillin in the treatment of hemorrhagic septicemia in cattle. In my opinion, one or both of the above cases would have died without this product.

VINCENT J. PEPPE

Canaan, Conn.

Veterinary License Reciprocity and Registration Fees

A survey on the reciprocity and fees for licensing graduate veterinarians in the various states was made recently. The table shows that of the 48 states and the District of Columbia, only 28.5% practice reciprocity with other states.

The examination fee ranges from $5.00 to $25.00. The table shows that 4% have a $5.00 examination fee; 2% a $7.00 fee; 55.1% a $10.00 fee; 16.4% a $15.00 fee; 6.1% a $20.00 fee and 16.4% have a $25.00 fee for examination for a license to practice.

The yearly renewal fee ranges from nothing to $15.00. Thirty-seven per cent have no fee, 20.5% have a $1.00 fee; 22.5% a $2.00 fee; 6% a $3.00 fee; 2% a $4.00 fee; 6% a $5.00 fee; 2% a $7.50 fee; 2% a $10.00 fee and 2% have a $15.00 fee for the annual renewal of a license to practice.

Since the personnel of veterinary examining boards is ever changing and the dates on which examinations are held vary in most states these names and dates are not given in the table. Those desiring to apply for a license in any state should write to the secretary of state at the state capitol for this information or better, to the state veterinarian, whose address in most instances is the state capitol.

This report shows a considerable variation in reciprocity and fees. It would appear that a standardization and agreement on reciprocity and fees among the states would be of benefit to them as well as to prospective licensees.

STEPHEN SHANNON
Midland, Tex.

TABLE I.—FEES FOR EXAMINATION FOR VETERINARY LICENSES

State	Reciprocity with	Examination fee	Reciprocity fee	Yearly renewal fee
Alabama	None	$15	None	$1.00
Arizona	None	10	None	2.00
Arkansas*	None	10	None	None
California	None	25	None	7.50
Colorado	None	15	None	None
Connecticut	None	10	None	1.00
Delaware	Pa.**	10	$10	10.00
District of Columbia	None	10	None	None
Florida	None	25	None	5.00
Georgia	None	10	None	None
Idaho	N. D., Okla., Kan., Mont., Nev., Utah	25	25	2.00
Illinois	Optional§	20§§	50	None
Indiana	Mich., Tex., S. D., Ark.	10	10	1.00
Iowa	None	25	None	1.00
Kansas	N. D., Neb., Idaho	10	10	5.00
Kentucky	None	7	None	2.00
Louisiana	None	10	None	None
Maine	None	10	None	1.00
Maryland	None	10	None	None
Massachusetts	None	15	None	None
Michigan	Mont., Neb., O., Pa., Ind., Tex.	10	10	None
Minnesota	None	25	None	2.00
Mississippi	Not known	10	Not known	None
Missouri	None	10	None	None
Montana	Mich., Ida., Utah, Tex.	10	10	2.00
Nebraska	Kan., Mich., Okla., S. D.†	20	40	1.00
Nevada	Idaho	10	10	None
New Hampshire	None	10	None	2.00
New Jersey	None	25	None	None
New Mexico	None	25	None	15.00
New York	None	10	None	1.00
North Carolina	None	10	None	None
North Dakota	Tex., Idaho	15	15	3.00
Ohio	Mich.	10	10	None
Oklahoma	All states††	15	25	3.00
Oregon	None	15	None	3.00
Pennsylvania	None	10	None	2.00
Rhode Island	None	10	None	2.00
South Carolina	None	10	None	4.00
South Dakota	Mich., Tex., Ind., Kan., Neb., Ark.	10	10	2.00
Tennessee	None	10	None	None
Texas	Ga., Ind., Mich., Miss., S. D., N. D.	15	20	1.00
Utah	Idaho‡	15	15	2.00
Vermont	None	10	None	2.00
Virginia	None	5	None	None
Washington	None	25	None	5.00
West Virginia	None	20	None	1.00
Wisconsin	None	5	None	1.00
Wyoming	None	10	None	None

*Taken from a 1941 record. **Other states by agreement. †Special requirements also. §With Department of Registration. §§License fee, $5.00 additional. ‡Other states upon agreement.

Keratitis with Secondary Glaucoma in the Dog

An eight-month-old cocker spaniel with an ophthalmia of both eyes was brought in for treatment. The dgo had previously been treated for distemper by another veterinarian and had run a temperature of 104° F. during most of the course of the disease.

Upon entering the clinic the following symptoms were noticed: lacrimation, cloudiness of the cornea, protrusion of the eyeballs and a temperature of 100.8° F. Because of the cloudiness of the cornea examination with the ophthalmoscope was impractical. The condition was diagnosed as keratitis punctata profunda with secondary glaucoma.

The first day's treatment consisted of a 5cc injection of a foreign protein (hog cholera anti-serum) subcutaneously in the neck. A hot Epsom salts pack was placed over the eyes for 20 minutes. The eyes were then treated with a 2% ointment of yellow oxide of mercury. 50,000 units of vitamin A and one vita-kap were given.

The next day the treatment of the preceding day was repeated and in addition buty-metaphen ointment instilled into the conjunctivae. This treatment was continued for two more days after which the dog was sent home with the eyes apparently normal and vision restored.

E. E. WEDMAN

Sedgwick, Kansas

Injuries to a Horse from Collision with a Car

Monday, April 2, 1945, a five-year-old, 1600-pound Suffolk mare was presented to the Kansas State College Clinic for treatment with a history of having been hit by a car. The mare had escaped from the stable the preceding Saturday night and wandered into the road where she was struck by Chevrolet coupe. Several minor injuries about the head and on the legs were sustained and there was a severe wound in the left thoracic wall. A veterinarian was called and he applied a pack to the wound to control the extensive hemorrhage and advised the owner to take the animal to the clinic. I was a senior student there at the time and was assigned to the case, which I think affords some features of more than usual interest.

As the mare was unloaded from the truck it was noticed that she was very reluctant to walk, being very stiff and sore—especially in the left forelimb. Closer examination revealed no fractures of any of the bones but there was considerable cutaneous emphysema in the left scapular region. At first, it was thought this probably originated from a puncture of the pleura but the subsequent examination proved that the air entered through the wound and extended upward into the subcutaneous tissues.

The external opening of the wound was in the region of the 7th rib, dorsal to the costochondral juncture. It extended through the skin and both the superficial and deep pectoral muscles and exposed the ribs. The wound extended forward and downward along the outer surface of the ribs toward the sternum a distance of 15 inches. Although some of the muscle fibers of the serratus thoracis muscle were severed the thoracic cavity was not pierced. At the bottom of the wound a steel object four inches long was palpated and,

A radiator ornament entering at the upper wound was forced through the tissues 15 inches to the site of the lower opening

upon removal, was identified as the radiator ornament from the car. The impact of the collision forced it through the tissues for a distance of 15 inches. The animal showed a marked dyspnea due to the lacerations along the thoracic wall. The temperature was 103.2° F. and the pulse was 40.

The mare was given a prophylactic dose of 3000 units of tetanus antitoxin. The wound was cleansed and powdered sulfanilamide applied and two ounces of the same remedy was given *per os*. The same treatment was repeated the next day. On the third day the temperature was 104.3° F., the mare was depressed with symptoms of septicemia.

The presence of pus and fluid exudate in the wound indicated the necessity for drainage to the wound. An incision was made at the lowest point of the tract, care being taken not to sever the external thoracic artery. The wound was flushed and sulfanilamide and 1% iodiform in mineral oil applied. This treatment was continued for four days. The after treatment consisted of daily swabbing of the wound to stimulate the healthy granulation tissue after which camphor-phenol antiseptic

was applied. Pyoktannin ointment was used on the minor bruises on the head and legs.

After drainage was obtained the septicemic symptoms disappeared, the temperature became normal and the mare made a satisfactory recovery and was sent home on the 21st day.

This case should serve to re-emphasize the importance of drainage in the treatment of wounds.

DUANE R. PETERSON

Bridgeport, Kansas

Leiomyosarcoma in a Dog

A brindle greyhound bitch which had had a successful racing reason the preceding year, developed a growth between the anus and the vulva which was removed surgically but recurred and, according to the owner who brought her in for treatment was considerably larger than before the operation.

The dog was given a thorough physical examination and found to be sound except for the presence of *Ancylostoma caninum* in the intestine as indicated by a flotation fecal examination. The growth under the anus was large, irregular and firm. An exploratory puncture, made with a sixteen gauge needle released a small quantity of bloody fluid.

Leiomyosarcoma

The area was shaved and washed with bichloride of mercury. Local anesthesia was obtained by infiltration with 1% procain. An incision was made dorso-ventrally over the center of the growth and the mass of tissue resected. The left side of the growth was well encapsulated and was easily dissected from the skin and the muscle beneath it. On the right, however, the growth had infiltrated the skin and underlying muscles making removal very difficult. The tumor was removed in so far as possible and the edges of the wound closed with interrupted sutures of linen thread.

Microscopic sections of the growth showed it to be a leiomyosarcoma.

The wound was treated with sulfanilamide powder and sulfanilamide ointment. At the end of 44 days' treatment, the tumor showed signs of returning. Since the dog had lost her racing and breeding value the owner was not willing to continue treatment.

Euthansia was performed six weeks after treatment was begun.

Post-mortem examination revealed no other neoplasms in the body.

THEODORE H. REED

Ceylon, Minn.

Tetanus in a Steer

A Hereford steer, aged ten months, arrived at the clinic March 8, 1945, with a history of having been castrated three weeks previously and having been stiff for three or four days.

The symptoms were: a very stiff gait, exophthalmia, rough hair coat, very tense and hard dorsal muscles and bloat of the rumen. The animal could walk and eat but did so reluctantly. The tail was slightly raised and, when loud noises were made, the animal became very rigid and assumed a saw-horse stance. The temperature was 102° F. With this history and these symptoms a diagnosis of tetanus was made.

The treatment the first day was one gallon of 1% pine oil in water *via* stomach tube; tetanus antitoxin (3000 units) intramuscularly and 500cc of dextrose solution intravenously. The next day the animal was unable to rise and showed more tetanic cramps. Practically every muscle in its body was tense and hard. Even the ears were rigid. Supportive and sedative treatment was decided upon and 100cc of 20% magnesium sulfate solution, 500cc of dextrose solution and 1000cc of normal saline solution were given intravenously. The stomach tube was passed, and one gallon of milk in a gallon of water was pumped into the rumen. The steer was unable to grasp feed, but could chew and swallow hay if it were put into his mouth. This was done although it was very time consuming, however, it payed off in maintaining the animal's strength and thus aiding recovery. This treatment was continued for one week with an occasional substitution of

8cc of nembutal intravenously in place of the magnesium sulfate solution.

On the eighth day the animal was lifted to its feet and could stand with support. He drank milk and water from a bucket, Medication was discontinued. Careful nursing, but no medication, was continued for the next week. The muscles of the back and legs gradually lost their rigidity. On the seventeenth day of treatment, the animal was able to rise without assistance and was led out of the barn to graze on green grass. This was repeated each day for 20 days and recovery was rapid. Then the animal was taken home thin in flesh but well.

The major contributing factor to this animal's recovery was not medical care, but the attention given to its bodily needs, i.e., food, water and shelter. It is impractical for the veterinarian to administer all this care himself. However, it is feasible for the farmer or his son to give this attention, after the animal can drink, if detailed instructions are supplied. Good steers are worth up to $300 at the present price of steaks—if you can get them.

HARVEY J. HENSLEY

Osborne, Kansas

Feeding an Orphan Colt

The artificial feeding of new born foals has until recently been considered a difficult and uncertain task. Comparative composition of milk from different species has been studied and is now understood so that it is possible to modify cow's milk to approach the physical and chemical constituents of mare's milk. However, nurse mares should be obtained when possible for feeding valuable orphan colts.

When nurse mares are not available the following plan of feeding the orphan foal has succeeded in some cases.

1. It is necessary to feed with a nipple. However, colts will learn to drink at a very early age. They should be fed at frequent intervals and in small quantities, as overfeeding may lead to severe indigestion.

2. For the first day or two, feed 125cc every hour, warming the milk to 100° F. As the colt becomes older, increase the amount of milk at a feeding and the period between feedings until the foal is fed two quarts four times a day. This is for a foal of average size.

3. After the first few days, whole milk (unmodified) may be used and the foal taught to drink it from a pail. Sweet, skimmed milk may replace whole milk about the 5th or 6th week; and at the end of 10 to 12 weeks the foal may be given all it will drink three times a day. The temperature should always be around 100° F.

4. Dimock, Head of the Animal Pathology Department at the University of Kentucky, states that a very satisfactory feed for the foal during the first few days is Jersey or Guernsey milk two parts and water one part to which is added sugar at the rate of one ounce per 1,000cc of the mixture. If Holstein milk is used employ three parts of milk to one of water. Also Nestle's baby food formula may be used alone or combined with the foregoing mixture in equal parts.

5. Another formula that has been used with success consists of lime water, two ounces, cane sugar, one ounce, and milk, 500cc.

6. Only milk from a healthy cow, on a good ration or good pasture should be used. And she should be in the first half of the lactation period.

7. Don't pasteurize the milk if it is known to be relatively clean and free of bacteria. If only contaminated milk is available it should be pasteurized.

8. By the time the foal is four weeks old, it should be eating some grain. It may be mixed in the milk or placed in the bucket as soon as the colt has finished drinking the milk.

Much study has been given to the preparation of formulae for feeding calves but much less research has been devoted to colt feeding, but the following regimen, although simple, has given very good results. Equal parts of yellow corn meal, rolled oats (for human use) and bran. This mixture should be fed in increasing amounts each day until the colt is eating two to three pounds a day when four months of age.

In the winter, and especially if the cow is not on the best of feed, cod liver oil, 15 to 30cc daily may be given to the colt as a source of vitamins A and D. It should be discontinued as soon as the condition of the colt indicates it is no longer needed.

Good legume hay should be given to the foals as soon as they will eat it and also a supply of fresh clean water as soon as they will drink it.

Contrary to a belief held by many, colostrum is not necessary for the expulsion of meconium from the intestine of foals. Mare's milk usually flows from the udder several days before parturition and all the colostrum has escaped before birth yet the meconium is not retained.

The importance of feeding a foal correctly cannot be overemphasized. A thrifty, well-fed colt should have half of its entire growth by the end of its first year of life.

J. J. RIDGWAY

Altadena, Calif.

★★★ BUY WAR BONDS ★★★
AND HOLD THEM

Abstracts

Horse Requirements of Vitamin A

Vitamin A studies by Guilbert, Howell and Hart,[41] University of California, indicate that the daily requirement of vitamin for horses is from 15 to 22 I. U. (33 to 50 I. U. carotene) per kilogram, body weight. They suggest that three to four times this minimum may be necessary for reproduction and lactation.

Diagnosis of Pregnancy

An accurate method[77] of determining pregnancy, when ordinary methods do not lead to a positive diagnosis, consists of slipping the fetal membranes and then the dorsal uterine wall between the thumb and finger *via* means of rectal examination. It may be unsafe to use hormone therapy for sterility until it is determined that the cow is non-pregnant. To impregnate cows artificially is dangerous unless pregnancy has definitely been ruled out. It is unwise to remove a corpus luteum from the ovary until the uterine horns have been carefully palpated from cervix to apex to be sure pregnancy does not exist.

Intra-arterial Injection Treatment

Intra-arterial injection has been practiced for more than 30 years but, although it is more direct, more economical of the medicament and more effective than intravenous medication for infection of the extremities, as compared with the latter it has been little used, for reasons that are not clear.

Colloidal silver, acriflavine, gentian violet and other drugs and sera have been used intra-arterially. Luccarelli so used mercurochrome (1938) and reported 36 cases of severe disorders of the extremities in which the local pathologic condition was favorably influenced in every case. Dos Santos injected sodium iodide intra-arterially and demonstrated by means of fluoroscopy the deposit of the drug in the tissues of the limb. Procaine administered in this way gives satisfactory anesthesia of the part.

The authors[83] injected penicillin into the femoral (or brachial) artery in 24 severe cases (most of them diabetic gangrene) which by ordinary treatment would have required amputation. They describe the results as spectacular and much better than would have been expected from intravenous injections of the penicillin.

The injection requires careful technic, since it is easy to transfix an artery with a hypodermic needle. The authors advise dissolving 50,000 units of penicillin in 10cc of sterile, distilled water in a 20cc syringe. A 20-gauge needle is inserted in the artery. When rhymic jets of blood appear in the syringe the needle is within the lumen of the artery. The injection should not be made until pulsating waves of bright red blood appear in the syringe. The injection is made at the rate of 1cc per second and immediately it is completed a tourniquet (blood pressure cuff) is applied and allowed to remain for 10 minutes. The authors gave the injections once daily and thereby maintained a high level of penicillin in the limb.

The intra-arterial injection of penicillin is economical, simple, convenient and highly effective. Blood stasis following the injection is essential. Where the injection is for the treatment of an infected wound débridement is necessary since the blood does not circulate in devitalized tissue and hence the penicillin would not reach infectious organisms in this tissue.

Vitamin A Deficiency Common in Poultry

For the past two years vitamin A deficiency has been observed frequently in the specimens sent to the diagnostic laboratory of the Ontario Veterinary College.[82]

Vitamin A is essential to life and growth in poultry and for maintaining the normal structure of mucous membrane epithelium.

"Clinically, this deficiency is manifested in chicks at three to four weeks of age by cessation of growth, drowsiness, weakness, staggery gait, emaciation and ruffling of feathers. The shanks and beaks show a lack of yellow color; combs and wattles become pale. Lacrimation, presence of yellow cheese-like material under the eyelids and xerophthalmia are occasional symptoms. With adult birds unthriftiness, marked decrease in egg production and hatchability, and increase in embryonic mortality in eggs from affected birds occurs."

The lesions exhibited on post-mortem examination are chiefly on the mucous membranes of the head, esophagus, crop, respiratory tract and are characterized by white elevated nodules.

Correction of vitamin A deficiency lies in supplying this vitamin in large quantities. The birds respond promptly to treatment, that is,

[41] Guilbert, H. R., Howell, C. E., and Hart, G. H. *J. Nutr.*, 19, p. 91, 1940.

[77] Fincher, M. G. Some phases of sterility in cattle. *Vet. Rec.* 56:50, pp. 488-489, 1944.—*A. H. Bryan.*

[83] Glasser, Thomas J., Herlin, Jr., John and Pollock, Boris., Intra-arterial injection of penicillin for infection of the extremities. *J. Am. Med. Assn.*, 126:11, pp. 796-802. 1945.

[82] Durrell, W. B., Avitaminosis A in poultry. *Can. J. Comp. Med. & Vet. Sci.*, 9:6, pp. 163-165. 1945.

if the condition be not too far advanced.

Prevention of vitamin A deficiency in poultry consists in supplying a ration containing the vitamin or the carotinoid pigments in sufficient quantity to meet the body requirement. Green feed, alfalfa meal, fish oils and silage are good sources of carotene and vitamin A.

Bovine Mastitis

Incidence of infection in bovine mastitis is closely linked with age, teat patency and exposure to infection.[74] Both the two latter usu-

Slaughter after the third lactation resulted in a two-fold benefit

ally increase in importance with age. Torrance's plan was to encourage the keeping of herds restricted to home-bred cows in the first and second lactation periods only; all cows being disposed of at the third calving. The plan was designed primarily to reduce the incidence of tuberculosis but in practice was found to reduce also the incidence of clinical mastitis to a minimum.

Add Psittacosis to Conquest by Penicillin

Flippin, Gaydash and Fittipoldi report[81] success in the treatment of psittacosis in a woman. She contracted the disease from the bite of a parrot and suffered a migratory type of pneumonia which resisted sulfonamide treatment for 19 days. Definite improvement was apparent within 36 hours after the beginning of penicillin administration.

Since no treatment heretofore attempted in ornithosis of pigeons has given any promise of being effective, penicillin may be worth a trial in carrier pigeons in which ornithosis has caused considerable loss recently.

[81] Flippin, Harrison F., Gaydash, Michael J., and Fittipoldi, Wm. V., Penicillin for human psittacosis, *J. Am. Med. Assn.* 128:4, p. 274, 1945.

[74] Francis, J., and Steward, J. S. The problems of bovine Mastitis. *Vet. Rec.* 56:45, pp. 421-425, 1944.—*A. H. Bryan.*

Book Reviews

List of Parasites of Domestic Animals in North America. By *Edward A. Benbrook*, V.M.D., Professor of Veterinary Pathology, Division of Veterinary Medicine, Iowa State College. Mimeograph, 44 pages, paper bound (spiral). Published by Burgess Publishing Co., Minneapolis 15, Minn. 1945.

This list includes parasites of the horse, cattle, sheep, goat, swine, dog, fox, cat, chicken, turkey, goose, duck, guinea fowl and pigeon. The list is intended to supplement lectures and laboratory work in a course in veterinary parasitology.

The parasites are grouped by the organ or tissues inhabited and is complete for all known parasites. The scientific name, the common name, the classification, the maximum size, the species infested and the locations are given for each parasite.

Index of Diagnosis, Clinical and Radiological for the Canine and Feline Surgeon with Treatment. By *Hamilton Kirk*, M.R.C.V.S. Second edition; 587 pages, 302 illustrations, including 65 radiographs. Published by Williams and Wilkins, Baltimore. 1945. Price $9.00.

In the review of the first edition of this work[1] it was stated: "This work is a useful and welcome one in a field where it is much needed." The same appraisal applies to this edition for there has been little change from the original. In the former review it was pointed out that the arrangement of the text is unorthodox, the diction sometimes careless and many statements awkward and sometimes ambiguous. Regrettably, little attempt to remedy these defects or even to correct misspelled words appears to have been made in the revision. However that a new edition should have been required so soon would indicate that the vast amount of information the text provides more than makes up for its faults.

As in the first edition, the author's treatment for some ailments is given. The plan or system, if any, by which diseases are selected for therapeutic discussion or are ommitted is not apparent, but the suspicion is aroused that the author entertains pet theories as to therapy in certain conditions and has embraced this opportunity to air them. In the reviewer's opinion these discussions of treatment add to the cost without contributing anything of value to the work. They have not been brought uptodate in the second edition and some of them were outmoded even in the first, e.g., the discussion of vitamins, not to mention use of the sulfa drugs, penicillin or organ therapy.

The work is priced too high. With first edi-

[1] *Vet. Med.*, 34:7, p. 458, 1939, which see for an enumeration of the contents.

tions, when the demand is unknown the publisher may deem it wise to print only a small number of copies and thus the cost per copy is high. With second editions, the distribution can be forecast with some accuracy and the price of scientific books should be set as low as circumstances permit. This is mentioned because of an obvious tendency during the past two or three years to attach fancy prices to plain veterinary books—even mimeographed volumes. Seventy-five years ago it was not uncommon for 100-page volumes of "Priceless Secret Receipts" to sell for as much as $25.00 per copy. We should not be heading back into that era of veterinary literature.

* * * *

The Semen of Animals and Its Use for Artificial Insemination. By *James Anderson*, B.Sc., Ph.D., M.R.C.V.S., Experimental Station, Naivasha, Kenya. Paper, 151 pages; 19 illustrations. Published by the Imperial Bureau of Animal Breeding and Genetics. 1945. Distributed by Imperial Agricultural Bureaux, Agricultural Research Bldg., Penglais, Aberystwyth, Wales. Price $2.00.

This is a remarkably comprehensive and skillfully arranged discussion of the subject of artificial insemination of animals. Although it comprises but 151 pages, the pages are large and the type condensed so that the contents equal in extent that of the usual 300-page text.

In addition to the author's important contribution to the text from his own experience and research, he has summarized the work of others to the extent of approximately 600 manuscripts, bulletins and chapters of scientific works. This gives the text world-wide application.

Any book reviewed in these pages, or any other book if available, may be obtained by remitting the published price to VETERINARY MEDICINE, 7632 S. Crandon Ave., Chicago 49. Bulletins and Circulars should be requested direct from the address given in the notice. Generally they are supplied free unless a price is stated.

The publication is in three parts. Part I is directed particularly to the need of the scientific worker for a detailed review of the literature dealing with the study of semen, the factors which affect its production, and the properties and reactions which affect its use for insemination. Part II embraces a discussion of the use of artificial insemination in the different species, of its application in different countries and circumstances, and of the limitations imposed on its use by various factors, including those arising from the physiological processes of female reproduction. Part III describes the actual technics of semen collection, examination and handling, and of insemination; it is thus the section of most direct interest to those concerned with the practical application of the method.

The discussion applies mainly to cattle, sheep, horses, and swine, but adequate attention is given to the dog, fox, rabbit, fowl and turkey. The treatise is scientific and authoritative and will prove of great convenience and value to veterinarians having anything to do with artificial insemination.

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Useful Bulletins, Circulars, Etc.

Milk Goats in Tennessee. Tennessee Agr. Exp. Sta., Knoxville.

Report of the Chief of the Bureau of Dairy Industry, 1944. U. S. Dept. Agr., Washington.

Effect of Pregnancy on Quality of Beef. Bul. 508, Illinois Agr. Exp. Sta., Urbana.

Bluegrass Pastures. Bul. 504, Illinois Agr. Exp. Sta., Urbana.

Digest of the Literature on DDT. Publication No. E-631. U. S. Dept. Agr., Washington 25, D. C.

Whelping. One of Capt. Will Judy's dog booklet series. Judy Publishing Co., Chicago. Price 25 cents.

Nothing Takes the Place of Glycerine —1583 ways to use it. Glycerine Producers' Association, 295 Madison Ave., New York 17, N. Y.

Poultry Breeding. Poultry Breeding-Stock Selection for Desired Characters. Circ. No. 715, U. S. Dept. Agr., Washington.

Feeding Practices on Thoroughbred Farms. Published by "The Blood Horse," Box 1520, Lexington, Ky. Price 25 cents.

Recent Advances in Mastitis Control. By C. S. Bryan. Article 27-47 Michigan Agr. Exp. Sta., East Lansing.

Hemorrhagic Septicemia. Shipping Fever of Cattle. Farmers Bul. No. 1018, U. S. Dept. Agr., Washington.

Sulfonamides in Bovine Mastitis. A Study of the Effectiveness in the Elimination of Bovine Mastitis. Tech. Bul. No. 884, U. S. Dept. Agr., Washington.

Bovine Tuberculosis in the U. S. Its Conquest and Effect on Public Health. Reprint from *Am. Rev. of Tuberc.*, H. R. Smith, U. S. Yards, Chicago.

Isolation of the Bacillus Anthracis from Spinose Ear Ticks Ornithodorus Megnini —Reprint. Geo. W. Stiles. U. S. Dept. of Agriculture, Denver, Colorado.

Report of the Chief of the B.A.I. Annual Report of the many and varied activities of the Bureau for the fiscal year ending June 30, 1944. Bureau of Animal Industry, U. S. Dept. of Agr., Washington 25, D. C.

Carcinomas in Animals (Descriptive title). This 20-page separate from the yearbook (Vol. VI, 1943) of the veterinary college describes several cases of carcinoma in animals with suggestions as to methods of diagnosis; 11 illustrations. Source, same as for the preceding.